United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with North Carolina Army National Guard

Soil Survey of Camp Butner, North Carolina

How to Use This Soil Survey

The detailed soil map can be useful in planning the use and management of small areas.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the North Carolina Agricultural Research Service, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed as part of the soil surveys of Granville County, North Carolina, published in 1997 *(13)*, and Durham County, North Carolina, published in 1976 *(15)*. An evaluation of fieldwork and recompilation were completed in August 1998. Soil names and descriptions were approved in 1999. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1998. This soil survey was made cooperatively by the Natural Resources Conservation Service and the North Carolina Army National Guard.

The soil map in this survey may be copied without permission. Enlargement of this map, however, could cause misunderstanding of the detail of mapping. If enlarged, the map does not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: An area of Udorthents, formerly Georgeville soils, that is well suited to many uses due to its gently sloping, well drained soils.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is http://www.nrcs.usda.gov (click on "Technical Resources").

Contents

Issued May 1999

Foreword

This soil survey contains information that affects land use planning at Camp Butner. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Foresters can use it to evaluate the potential of the soil and the management needed for maximum timber production. Planners, engineers, and builders can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various decisions for land use or land treatment. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each soil is shown on the detailed soil map. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

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Soil Survey of
Camp Butner, North Carolina

United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
North Carolina Army National Guard

Camp Butner is in Granville and Durham Counties, North Carolina. The nearest urban area is Durham, which is 15 miles away. The land is owned by the State. Camp Butner is entirely within the Southern Piedmont Major Land Resource Area.

The survey area is heavily wooded and has small streams and swamps that are fordable, trails, and a road network. The terrain is moderately rolling. The installation has 5 machine gun and small arms ranges and a total of 162 firing points (figs. 1, 2, and 3).

The survey area stretches about 3.3 miles north to south and 3.1 miles east to west. It consists of 4,725 acres, including water areas that are less than 40 acres in size.

The survey area is part of the physiographic region known as the Southern Piedmont Province. This region is comprised of a series of upland ridges that are dissected by numerous drainage systems. The major landforms are ridges, hills, side slopes, low terraces, and flood plains. The survey area has one lake, Lake Butner. This lake receives water from several intermittent and perennial streams. Elevation ranges from about 350 feet at Lake Butner to 500 feet in the uplands. The average annual temperature in winter is 41 degrees, and that in summer is 76 degrees. Average annual precipitation is 44 inches. The frost-free season is about 200 days in length.

Information from the previously published soil surveys of Granville County, North Carolina, and Durham County, North Carolina, was used in making this report *(13, 15)*.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil (fig. 4). The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify

Figure 1.—A close-up of one of the firing ranges at Camp Butner, in an area of Udorthents, loamy. Leaving much of the area undisturbed helps to protect the soil from erosion.

Figure 2.—One of the rifle ranges at Camp Butner, in an area of Udorthents, loamy. These facilities are used for training National Guard and Highway Patrol officers.

Figure 3.—A close-up of a target on a firing range, in an area of Udorthents, loamy. Maintaining adequate vegetation is an excellent method of controlling erosion and ensuring the maximum use of this area.

Figure 4.—Onsite evaluations by soil scientists identify soil types and determine the properties of the soil.

predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify the soils. After describing the soils and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and

character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area are generally collected for laboratory analyses and for engineering tests. The data from these analyses and tests and from field-observed characteristics and soil properties are used to predict behavior of the soils under different uses. Interpretations are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a relatively high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in accurately locating boundaries.

Detailed Soil Map Units

The map units delineated on the detailed map represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the map, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is given under the heading “Use and Management of the Soils.”

A map unit delineation on a map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some “included” areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the map. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil map are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Helena sandy loam, 2 to 6 percent slopes, is a phase of the Helena series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the map. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Wateree-Rion-Wedowee complex, 15 to 30 percent slopes, is an example.

An *undifferentiated group* is made up of two or

more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Chewacla and Wehadkee soils, 0 to 2 percent slopes, frequently flooded, is an undifferentiated group in this survey area.

Table 1 gives the acreage and proportionate extent of each map unit. Other tables (see "Contents") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

ApB—Appling sandy loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Broad ridges
Shape of areas: Rounded or irregularly shaped
Size of areas: 10 to 50 acres

Composition

Appling soil and similar inclusions: 70 percent
Dissimilar inclusions: 30 percent

Typical Profile

Surface layer:
0 to 6 inches—yellowish brown sandy loam

Subsurface layer:
6 to 11 inches—yellowish brown sandy loam

Subsoil:
11 to 41 inches—yellowish red clay loam that has yellowish brown mottles
41 to 65 inches—yellowish red sandy clay loam that has very pale brown mottles

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Low
Surface runoff: Medium
Hazard of water erosion: Moderate
Slope class: Gently sloping
Organic matter content: Low
Natural fertility: Low
Reaction: Very strongly acid or strongly acid throughout the profile, except where surface layers have been limed
Parent material: Residuum weathered from felsic intrusive rocks
Depth to bedrock: More than 60 inches

Inclusions

Dissimilar inclusions:
- The slowly permeable Vance soils on narrow ridges and knolls
- Random areas of Wedowee soils that have saprolite within a depth of 40 inches
- Pacolet soils on hill slopes that have a subsoil that is redder than that of the Appling soil and have saprolite within a depth of 45 inches
- Random areas of eroded Appling soils that have a surface layer of clay loam or sandy clay loam

Similar inclusions:
- Appling soils that have a surface layer of loam, fine sandy loam, or coarse sandy loam

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

ApC—Appling sandy loam, 6 to 10 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Broad to narrow hill slopes
Shape of areas: Long or irregularly shaped
Size of areas: 5 to 50 acres

Composition

Appling soil and similar inclusions: 70 percent
Dissimilar inclusions: 30 percent

Typical Profile

Surface layer:
0 to 5 inches—brown sandy loam

Subsurface layer:
5 to 9 inches—reddish yellow sandy loam

Subsoil:
9 to 44 inches—yellowish red clay loam

Underlying material:
44 to 72 inches—multicolored sandy loam saprolite in shades of red, brown, and white

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Low
Surface runoff: Medium
Hazard of water erosion: Severe
Slope class: Strongly sloping
Organic matter content: Low
Natural fertility: Low
Reaction: Very strongly acid or strongly acid throughout the profile, except where surface layers have been limed
Parent material: Residuum weathered from felsic intrusive rocks
Depth to bedrock: More than 60 inches

Inclusions

Dissimilar inclusions:
- Random areas of the slowly permeable Vance soils
- Random areas of Wedowee soils that have saprolite within a depth of 40 inches
- Pacolet soils on hill slopes that have a subsoil that is redder than that of the Appling soil and have saprolite within a depth of 45 inches
- Random areas of eroded Appling soils that have a surface layer of clay loam or sandy clay loam

Similar inclusions:
- Appling soils that have a surface layer of loam, fine sandy loam, or coarse sandy loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

CaB—Cecil sandy loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Broad ridges
Shape of areas: Rounded or irregularly shaped
Size of areas: 10 to 350 acres

Composition

Cecil soil and similar inclusions: 70 percent
Dissimilar inclusions: 30 percent

Typical Profile

Surface layer:
0 to 8 inches—strong brown sandy loam

Subsoil:
8 to 24 inches—red clay that has red and strong brown mottles
24 to 40 inches—red clay that has strong brown mottles
40 to 55 inches—red clay loam

Underlying material:
55 to 65 inches—multicolored sandy loam saprolite in shades of red, yellow, and white

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Low
Surface runoff: Medium
Hazard of water erosion: Moderate
Slope class: Gently sloping
Organic matter content: Low
Natural fertility: Low
Reaction: Very strongly acid to moderately acid in the A horizon, except where limed, and strongly acid or very strongly acid in the B and C horizons
Parent material: Residuum weathered from felsic intrusive rocks
Depth to bedrock: More than 60 inches

Inclusions

Dissimilar inclusions:
- The slowly permeable Vance soils on narrow ridges and knolls
- Random areas of Wedowee soils that have a subsoil that is yellower than that of the Cecil soil and have saprolite within a depth of 45 inches
- Random areas of Pacolet soils that have saprolite within a depth of 45 inches; on hill slopes
- Random areas of eroded Cecil soils that have a surface layer of clay loam

Similar inclusions:
- Cecil soils that have a surface layer of loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

ChA—Chewacla and Wehadkee soils, 0 to 2 percent slopes, frequently flooded

Setting

Landscape: Piedmont drainageways
Landform: Chewacla—the slightly higher ridges on flood plains; Wehadkee—the lower swales on flood plains
Shape of areas: Broad to narrow and long or irregularly shaped
Size of areas: 10 to 100 acres

Composition

Chewacla soil and similar inclusions: 20 to 80 percent
Wehadkee soil and similar inclusions: 0 to 50 percent
Dissimilar inclusions: 10 to 30 percent

Typical Profile

Chewacla

Surface layer:
0 to 6 inches—yellowish brown loam

Subsoil:
6 to 15 inches—yellowish brown loam
15 to 19 inches—dark yellowish brown loam that has pale brown mottles

Underlying material:
19 to 33 inches—dark brown loam that has gray mottles
33 to 65 inches—light brownish gray sandy loam that has yellowish brown mottles

Wehadkee

Surface layer:
0 to 3 inches—brown loam
3 to 7 inches—brown loam that has brown mottles
7 to 11 inches—dark gray loam that has brown and dark brown mottles
11 to 14 inches—dark gray silt loam that has dark brown and brown mottles

Subsoil:
14 to 22 inches—dark gray loam that has brown mottles
22 to 42 inches—gray sandy clay loam that has strong brown mottles

Underlying material:
42 to 72 inches—gray stratified loamy sand, sand, and sandy loam having greenish gray mottles

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Chewacla—somewhat poorly drained; Wehadkee—poorly drained
Permeability: Moderate
Available water capacity: Moderate
Depth to seasonal high water table: Chewacla—0.5 foot to 2.0 feet from November through April; Wehadkee—0 to 1.0 foot from November through May
Hazard of flooding: Chewacla—frequently flooded for brief periods from November through April; Wehadkee—frequently flooded for long periods from November through June
Shrink-swell potential: Low
Surface runoff: Chewacla—slow; Wehadkee—very slow
Hazard of water erosion: None or slight
Slope class: Nearly level
Organic matter content: Moderate
Natural fertility: Moderate
Reaction: Chewacla—very strongly acid to slightly acid in the upper 40 inches, except where surface layers have been limed, and very strongly acid to moderately alkaline below a depth of 40 inches; Wehadkee—very strongly acid to neutral
Parent material: Alluvial sediments
Depth to bedrock: More than 60 inches

Inclusions

Dissimilar inclusions:
- Random areas of well drained soils
- Random areas of soils having a subsoil that has more sand than that of the Chewacla and Wehadkee soils
- Random areas of very poorly drained soils

Similar inclusions:
- Chewacla and Wehadkee soils that have a surface layer of silt loam, fine sandy loam, sandy loam, or loamy sand

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

GeB—Georgeville silt loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Broad ridges

Shape of areas: Round or irregularly shaped
Size of areas: 10 to 50 acres

Composition

Georgeville soil and similar inclusions: 85 percent
Dissimilar inclusions: 15 percent

Typical Profile

Surface layer:
0 to 8 inches—strong brown silt loam

Subsoil:
8 to 24 inches—red clay
24 to 37 inches—red clay that has reddish yellow mottles
37 to 50 inches—red clay loam that has reddish yellow mottles
50 to 62 inches—red clay loam that has reddish yellow mottles

Underlying material:
62 to 72 inches—red silt loam saprolite that has reddish yellow mottles

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Low
Surface runoff: Medium
Hazard of water erosion: Moderate
Slope class: Gently sloping
Organic matter content: Low
Natural fertility: Low
Reaction: Very strongly acid to neutral in the A horizon, except where limed, and very strongly acid or strongly acid in the B and C horizons
Parent material: Residuum weathered from mixed felsic and mafic volcanic rocks
Depth to bedrock: More than 60 inches

Inclusions

Dissimilar inclusions:
- Random areas of Tatum soils that have soft bedrock within a depth of 60 inches
- Random areas of Nason soils that have a subsoil that is yellower than that of the Georgeville soil and have soft bedrock within a depth of 60 inches
- Random areas of Cecil soils that have less silt than the Georgeville soil
- Georgeville soils that contain cobble-sized or larger rock fragments
- Georgeville soils that have a surface layer of clay loam

Similar inclusions:
- Georgeville soils that have a surface layer of loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

GeC—Georgeville silt loam, 6 to 10 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Broad to narrow hill slopes
Shape of areas: Long or irregularly shaped
Size of areas: 10 to 30 acres

Composition

Georgeville soil and similar inclusions: 90 percent
Dissimilar inclusions: 10 percent

Typical Profile

Surface layer:
0 to 5 inches—yellowish red silt loam

Subsoil:
5 to 35 inches—red clay
35 to 48 inches—red clay loam

Underlying material:
48 to 65 inches—strong brown silt loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Low
Surface runoff: Medium
Hazard of water erosion: Severe
Slope class: Moderately sloping
Organic matter content: Low
Natural fertility: Low
Reaction: Very strongly acid to neutral in the A horizon and very strongly acid or strongly acid in the B and C horizons
Parent material: Residuum weathered from mixed felsic and mafic volcanic rocks
Depth to bedrock: More than 60 inches

Inclusions

Dissimilar inclusions:
- Random areas of Tatum soils that have soft bedrock within a depth of 60 inches
- Random areas of Nason soils that have a subsoil that is yellower than that of the Georgeville soil and have soft bedrock within a depth of 60 inches
- Random areas of Cecil soils that have less silt than the Georgeville soil
- Georgeville soils that contain cobble-sized or larger rock fragments
- Georgeville soils that have a surface layer of clay loam

Similar inclusions:
- Georgeville soils that have a surface layer of loam

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

HeB—Helena sandy loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Interstream divides, heads of drainageways, depressions, and the lower hill slopes
Shape of areas: Broad and rounded or irregularly shaped
Size of areas: 5 to 150 acres

Composition

Helena soil and similar inclusions: 80 percent
Dissimilar inclusions: 20 percent

Typical Profile

Surface layer:
0 to 9 inches—grayish brown sandy loam

Subsurface layer:
9 to 12 inches—light yellowish brown sandy loam

Subsoil:
12 to 19 inches—brownish yellow sandy clay loam that has strong brown mottles
19 to 24 inches—yellowish brown clay that has pale brown and gray mottles
24 to 40 inches—strong brown clay that has gray mottles
40 to 50 inches—light gray clay loam that has brownish yellow and strong brown mottles

Underlying material:
50 to 60 inches—strong brown sandy loam saprolite that has light gray mottles
60 to 72 inches—strong brown sandy loam saprolite that has light gray and yellow mottles

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Available water capacity: Moderate
Depth to seasonal high water table: 1.5 to 2.5 feet from January through April
Shrink-swell potential: High
Surface runoff: Medium
Hazard of water erosion: Moderate
Slope class: Gently sloping
Organic matter content: Low
Natural fertility: Low
Reaction: Extremely acid to strongly acid throughout the profile, except where surface layers have been limed
Parent material: Residuum weathered from felsic intrusive rocks
Depth to bedrock: More than 60 inches

Inclusions

Dissimilar inclusions:
- The well drained Vance, Appling, and Wedowee soils on knolls and in the slightly higher areas
- The poorly drained Wehadkee soils and somewhat poorly drained Chewacla soils along drainageways and on adjacent flood plains

Similar inclusions:
- Helena soils that have a surface layer of loam or coarse sandy loam

Management

For general and detailed information about managing this map unit, see the section "Use and Management of the Soils."

HeC—Helena sandy loam, 6 to 10 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Hill slopes

Shape of areas: Long or irregularly shaped
Size of areas: 5 to 50 acres

Composition

Helena soil and similar inclusions: 80 percent
Dissimilar inclusions: 20 percent

Typical Profile

Surface layer:
0 to 6 inches—brown sandy loam

Subsurface layer:
6 to 11 inches—light yellowish brown fine sandy loam

Subsoil:
11 to 21 inches—brown sandy clay loam
21 to 26 inches—reddish yellow clay loam
26 to 40 inches—brown clay that has light brownish gray mottles
40 to 44 inches—light brownish gray clay loam

Underlying material:
44 to 65 inches—reddish brown clay loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Available water capacity: Moderate
Depth to seasonal high water table: 1.5 to 2.5 feet from January through April
Shrink-swell potential: High
Surface runoff: Medium
Hazard of water erosion: Severe
Slope class: Moderately sloping
Organic matter content: Low
Natural fertility: Low
Reaction: Extremely acid to strongly acid throughout the profile, except where surface layers have been limed
Parent material: Residuum weathered from felsic intrusive rocks
Depth to bedrock: More than 60 inches

Inclusions

Dissimilar inclusions:
- Random areas of the well drained Vance soils

Similar inclusions:
- Helena soils that have a surface layer of loam or coarse sandy loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

HrB—Herndon silt loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Broad ridges
Shape of areas: Round or irregularly shaped
Size of areas: 10 to 50 acres

Composition

Herndon soil and similar inclusions: 75 percent
Dissimilar inclusions: 25 percent

Typical Profile

Surface layer:
0 to 8 inches—brownish yellow silt loam

Subsoil:
8 to 22 inches—brownish yellow clay loam that has red mottles
22 to 34 inches—brownish yellow clay loam that has red and very pale brown mottles
34 to 40 inches—brownish yellow silty clay loam that has red and very pale brown mottles

Underlying material:
40 to 53 inches—mottled brownish yellow, red, and very pale brown silt loam saprolite
53 to 65 inches—multicolored silt loam saprolite in shades of red, yellow, and white

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Low
Surface runoff: Medium
Hazard of water erosion: Moderate
Slope class: Gently sloping
Organic matter content: Low
Natural fertility: Low
Reaction: Very strongly acid to slightly acid in the A horizon, except where limed, and extremely acid to strongly acid in the B and C horizons
Parent material: Residuum weathered from mixed felsic and mafic volcanic rocks
Depth to bedrock: More than 60 inches

Inclusions

Dissimilar inclusions:
- The moderately well drained or somewhat poorly

drained Lignum soils in depressions and at the head of drainageways
• Random areas of Nason soils that have soft bedrock at a depth of 40 to 60 inches
• Random areas of Tatum soils that have a subsoil that is redder than that of the Herndon soil and have soft bedrock at a depth of 30 to 60 inches
• Random areas of eroded Herndon soils that have a surface layer of silty clay loam

Similar inclusions:
• Herndon soils that have a surface layer of loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

HrC—Herndon silt loam, 6 to 10 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Hill slopes
Shape of areas: Long and narrow to broad or irregularly shaped
Size of areas: 10 to 25 acres

Composition

Herndon soil and similar inclusions: 65 percent
Dissimilar inclusions: 35 percent

Typical Profile

Surface layer:
0 to 4 inches—dark yellowish brown silt loam

Subsurface layer:
4 to 10 inches—yellowish brown silt loam

Subsoil:
10 to 35 inches—strong brown clay loam
35 to 55 inches—multicolored silty clay loam in shades of strong brown, brownish yellow, and red

Underlying material:
55 to 65 inches—multicolored silt loam saprolite in shades of red, yellow, and white

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Low
Surface runoff: Medium
Hazard of water erosion: Severe
Slope class: Moderately sloping
Organic matter content: Low
Natural fertility: Low
Reaction: Very strongly acid or strongly acid throughout the profile, except where surface layers have been limed
Parent material: Residuum weathered from mixed felsic and mafic volcanic rocks
Depth to bedrock: More than 60 inches

Inclusions

Dissimilar inclusions:
• Random areas of Nason soils that have bedrock at a depth of 40 to 60 inches
• Random areas of Tatum soils that have a subsoil that is redder than that of the Herndon soil and have soft bedrock at a depth of 30 to 60 inches
• Herndon soils that contain cobble-sized or larger rock fragments within a depth of 20 inches
• Random areas of eroded Herndon soils that have a surface layer of silty clay loam

Similar inclusions:
• Herndon soils that have surface layer of loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

IrB—Iredell loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Broad interstream divides and heads of drainageways
Shape of areas: Rounded or irregularly shaped
Size of areas: 5 to 10 acres

Composition

Iredell soil and similar inclusions: 85 percent
Dissimilar inclusions: 15 percent

Typical Profile

Surface layer:
0 to 6 inches—dark grayish brown loam

Subsoil:
6 to 10 inches—brown loam
10 to 24 inches—dark brown clay
24 to 28 inches—dark brown clay loam that has light brownish gray and strong brown mottles

Underlying material:
28 to 53 inches—mottled brownish yellow, light brownish gray, and black loam saprolite

Bedrock:
53 to 65 inches—weathered multicolored fractured diabase

Soil Properties and Qualities

Depth class: Deep
Drainage class: Moderately well drained
Permeability: Slow
Available water capacity: High
Depth to seasonal high water table: 1 to 2 feet from December through April
Shrink-swell potential: Very high
Surface runoff: Medium
Hazard of water erosion: Moderate
Slope class: Gently sloping
Organic matter content: Low
Natural fertility: Low
Reaction: Strongly acid to neutral in the A horizon, moderately acid to neutral in the B horizon, and neutral or slightly alkaline in the C horizon
Parent material: Residuum weathered from mafic intrusive rocks
Depth to bedrock: 40 to 60 inches to soft bedrock and more than 60 inches to hard bedrock

Inclusions

Dissimilar inclusions:
- Soils that are similar to the Iredell soil but have saprolite within a depth of 20 inches
- Poorly drained soils in slight depressions
- Random areas of eroded Iredell soils that have a surface layer of clay loam

Similar inclusions:
- Iredell soils that have a surface layer of sandy loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

LmB—Lignum silt loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Broad interstream divides, slight depressions, and heads of drainageways
Shape of areas: Rounded or irregularly shaped
Size of areas: 10 to 150 acres

Composition

Lignum soil and similar inclusions: 85 percent
Dissimilar inclusions: 15 percent

Typical Profile

Surface layer:
0 to 10 inches—light yellowish brown silt loam

Subsoil:
10 to 14 inches—light yellowish brown silt loam
14 to 20 inches—light yellowish brown silty clay loam that has strong brown and gray mottles
20 to 34 inches—brownish yellow silty clay loam that has yellowish brown and gray mottles
34 to 39 inches—brownish yellow silt loam that has light gray and strong brown mottles

Underlying material:
39 to 46 inches—multicolored silt loam saprolite in shades of brown, yellow, and gray

Bedrock:
46 to 62 inches—weathered multicolored fractured schist

Soil Properties and Qualities

Depth class: Deep
Drainage class: Moderately well drained or somewhat poorly drained
Permeability: Very slow
Available water capacity: High
Depth to seasonal high water table: 1.0 to 2.5 feet from December through May
Shrink-swell potential: Moderate
Surface runoff: Medium
Hazard of water erosion: Moderate
Slope class: Gently sloping
Organic matter content: Low
Natural fertility: Low
Reaction: Very strongly acid or strongly acid throughout the profile, except where surface layers have been limed
Parent material: Residuum weathered from felsic volcanic rocks
Depth to bedrock: 40 to 60 inches to soft bedrock and more than 60 inches to hard bedrock

Inclusions

Dissimilar inclusions:
- Random areas of the well drained Herndon soils
- Random areas of soils that are similar to the Lignum soil but have hard bedrock at a depth of 20 to 40 inches
- Random areas of Lignum soils that have a surface layer of gravelly loam

Figure 5.—A well-managed stand of loblolly pine in an area of Lignum silt loam, 2 to 6 percent slopes.

Similar inclusions:
- Lignum soils that have a surface layer of fine sandy loam or loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils” (fig. 5).

NaB—Nason gravelly loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Narrow ridges
Shape of areas: Rounded or irregularly shaped
Size of areas: 5 to 30 acres

Composition

Nason soil and similar inclusions: 75 percent
Dissimilar inclusions: 25 percent

Typical Profile

Surface layer:
0 to 7 inches—grayish brown gravelly loam

Subsurface layer:
7 to 12 inches—yellowish brown loam

Subsoil:
12 to 24 inches—strong brown clay loam
24 to 32 inches—yellowish red clay
32 to 37 inches—strong brown gravelly silty clay loam

Underlying material:
37 to 42 inches—multicolored gravelly silt loam saprolite in shades of red, brown, and white

Bedrock:
42 to 60 inches—weathered multicolored fractured schist

Soil Properties and Qualities

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate

Available water capacity: Moderate
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Moderate
Surface runoff: Medium
Hazard of water erosion: Moderate
Slope class: Gently sloping
Organic matter content: Low
Natural fertility: Low
Reaction: Very strongly acid or strongly acid throughout the profile, except where surface layers have been limed
Parent material: Residuum weathered from felsic volcanic rocks
Depth to bedrock: 40 to 60 inches to soft bedrock and more than 60 inches to hard bedrock

Inclusions

Dissimilar inclusions:
• The moderately well drained or somewhat poorly drained Lignum soils in depressions and at the head of drainageways
• Random areas of Herndon soils that have bedrock below a depth of 60 inches
• Nason soils that have cobbles, stones, or boulders on the surface
• Random areas of Nason soils that do not have a gravelly surface layer

Similar inclusions:
• Nason soils that have a surface layer of gravelly sandy loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

NaC—Nason gravelly loam, 6 to 10 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Narrow ridges and hill slopes
Shape of areas: Long or irregularly shaped
Size of areas: 5 to 25 acres

Composition

Nason soil and similar inclusions: 85 percent
Dissimilar inclusions: 15 percent

Typical Profile

Surface layer:
0 to 2 inches—brown gravelly loam

Subsurface layer:
2 to 11 inches—brownish yellow gravelly silt loam

Subsoil:
11 to 16 inches—reddish yellow silty clay loam
16 to 31 inches—strong brown silty clay loam
31 to 39 inches—reddish yellow silt loam

Underlying material:
39 to 52 inches—multicolored gravelly silt loam saprolite in shades of red and yellow

Bedrock:
52 to 62 inches—weathered multicolored fractured schist

Soil Properties and Qualities

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Low
Surface runoff: Medium
Hazard of water erosion: Severe
Slope class: Moderately sloping
Organic matter content: Low
Natural fertility: Low
Reaction: Very strongly acid or strongly acid throughout the profile, except where surface layers have been limed
Parent material: Residuum weathered from felsic volcanic rocks
Depth to bedrock: 40 to 60 inches to soft bedrock and more than 60 inches to hard bedrock

Inclusions

Dissimilar inclusions:
• Random areas of Herndon soils that have bedrock below a depth of 60 inches
• Nason soils that have cobbles, stones, or boulders on the surface
• Random areas of Nason soils that do not have a gravelly surface layer

Similar inclusions:
• Nason soils that have a surface layer of gravelly sandy loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

NaE—Nason gravelly loam, 10 to 25 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Narrow hill slopes adjacent to flood plains and drainageways
Shape of areas: Long and irregularly shaped
Size of areas: 10 to 75 acres

Composition

Nason soil and similar inclusions: 90 percent
Dissimilar inclusions: 10 percent

Typical Profile

Surface layer:
0 to 8 inches—grayish brown gravelly loam

Subsurface layer:
8 to 11 inches—yellowish brown loam

Subsoil:
11 to 24 inches—strong brown clay loam
24 to 32 inches—yellowish red clay loam
32 to 40 inches—yellowish red clay loam that has brown mottles

Bedrock:
40 to 62 inches—weathered multicolored fractured schist

Soil Properties and Qualities

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Moderate
Surface runoff: Rapid
Hazard of water erosion: Very severe
Slope class: Strongly sloping or moderately steep
Organic matter content: Low
Natural fertility: Low
Reaction: Very strongly acid or strongly acid throughout the profile, except where surface layers have been limed
Parent material: Residuum weathered from felsic volcanic rocks
Depth to bedrock: 40 to 60 inches to soft bedrock and more than 60 inches to hard bedrock

Inclusions

Dissimilar inclusions:
- Nason soils that have cobbles, stones, or boulders on the surface
- Random areas of Nason soils that do not have a gravelly surface layer
- Random areas of soils that have soft bedrock within a depth of 40 inches

Similar inclusions:
- Nason soils that have a surface layer of gravelly sandy loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

NaF—Nason gravelly loam, 25 to 50 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Narrow hill slopes adjacent to flood plains and drainageways
Shape of areas: Narrow to irregularly shaped
Size of areas: 10 to 50 acres

Composition

Nason soil and similar inclusions: 75 percent
Dissimilar inclusions: 25 percent

Typical Profile

Surface layer:
0 to 2 inches—very dark grayish brown gravelly loam

Subsurface layer:
2 to 5 inches—brown gravelly loam

Subsoil:
5 to 15 inches—yellowish brown silty clay loam
15 to 26 inches—yellowish brown clay loam
26 to 32 inches—brownish yellow silty clay loam

Underlying material:
32 to 40 inches—multicolored gravelly silt loam saprolite in shades of red, yellow, and white

Bedrock:
40 to 62 inches—weathered multicolored fractured schist

Soil Properties and Qualities

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Low

Surface runoff: Rapid
Hazard of water erosion: Very severe
Slope class: Steep
Organic matter content: Low
Natural fertility: Low
Surface runoff: Rapid
Reaction: Very strongly acid or strongly acid throughout the profile, except where surface layers have been limed
Parent material: Residuum weathered from felsic volcanic rocks
Depth to bedrock: 40 to 60 inches to soft bedrock and more than 60 inches to hard bedrock

Inclusions

Dissimilar inclusions:
• Nason soils that have cobbles, stones, or boulders on the surface
• Random areas of soils that have soft bedrock within a depth of 40 inches
• Random areas of Nason soils that do not have a gravelly surface layer

Similar inclusions:
• Nason soils that have a surface layer of gravelly sandy loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

PaE—Pacolet sandy loam, 10 to 25 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Hill slopes adjacent to flood plains and drainageways
Shape of areas: Long and narrow or irregularly shaped
Size of areas: 10 to 50 acres

Composition

Pacolet soil and similar inclusions: 85 percent
Dissimilar inclusions: 15 percent

Typical Profile

Surface layer:
0 to 8 inches—reddish brown sandy loam

Subsoil:
8 to 25 inches—red clay
25 to 40 inches—red clay loam

Underlying material:
40 to 65 inches—red loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Low
Surface runoff: Rapid
Hazard of water erosion: Very severe
Slope class: Strongly sloping or moderately steep
Organic matter content: Low
Natural fertility: Low
Reaction: Very strongly acid to slightly acid in the A horizon, except where limed, and very strongly acid to moderately acid in the B and C horizons
Parent material: Residuum weathered from felsic intrusive rocks
Depth to bedrock: More than 60 inches

Inclusions

Dissimilar inclusions:
• Random areas of Cecil soils that have saprolite below a depth of 40 inches
• Random areas of Tatum soils that have a higher content of silt in the subsoil than the Pacolet soil and have soft bedrock at a depth of 40 to 60 inches
• Pacolet soils that have cobbles or widely scattered stones or boulders on the surface

Similar inclusions:
• Pacolet soils that have a surface layer of loam or clay loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

PaF—Pacolet sandy loam, 25 to 50 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Hill slopes adjacent to flood plains and drainageways
Shape of areas: Long and narrow or irregularly shaped
Size of areas: 5 to 20 acres

Composition

Pacolet soil and similar inclusions: 70 percent
Dissimilar inclusions: 30 percent

Typical Profile

Surface layer:
0 to 4 inches—yellowish red sandy loam
4 to 10 inches—dark yellowish brown sandy loam

Subsoil:
10 to 26 inches—red clay loam
26 to 34 inches—yellowish red loam

Underlying material:
34 to 65 inches—strong brown fine sandy loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Moderate
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Low
Surface runoff: Rapid
Hazard of water erosion: Very severe
Slope class: Steep
Organic matter content: Low
Natural fertility: Low
Reaction: Very strongly acid to slightly acid in the A horizon, except where limed, and very strongly acid to moderately acid in the B and C horizons
Parent material: Residuum weathered from felsic intrusive rocks
Depth to bedrock: More than 60 inches

Inclusions

Dissimilar inclusions:
• Random areas of Tatum soils that have soft bedrock at a depth of 40 to 60 inches and have a higher content of silt in the subsoil than the Pacolet soil
• Random areas of soils that have soft bedrock at a depth of 20 to 40 inches
• Pacolet soils that have cobbles or widely scattered stones or boulders on the surface

Similar inclusions:
• Pacolet soils that have a surface layer of loam or clay loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

TaE—Tatum loam, 10 to 25 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Hill slopes adjacent to flood plains and drainageways
Shape of areas: Long and narrow or irregularly shaped
Size of areas: 10 to 50 acres

Composition

Tatum soil and similar inclusions: 95 percent
Dissimilar inclusions: 5 percent

Typical Profile

Surface layer:
0 to 5 inches—strong brown loam

Subsoil:
5 to 31 inches—red clay
31 to 40 inches—red silty clay loam

Underlying material:
40 to 58 inches—yellowish red silty clay loam saprolite

Bedrock:
58 to 70 inches—weathered multicolored fractured schist

Soil Properties and Qualities

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: High
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Low
Surface runoff: Rapid
Hazard of water erosion: Very severe
Slope class: Strongly sloping or moderately steep
Organic matter content: Low
Natural fertility: Low
Reaction: Very strongly acid or strongly acid throughout the profile, except where surface layers have been limed
Parent material: Residuum weathered from mixed felsic and mafic volcanic rocks
Depth to bedrock: 40 to 60 inches to soft bedrock and more than 60 inches to hard bedrock

Inclusions

Dissimilar inclusions:
• Random areas of Georgeville soils that have bedrock below a depth of 60 inches
• Tatum soils that have cobble-sized or larger fragments on the surface

Similar inclusions:
• Tatum soils that have a surface layer of silt loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

Ud—Udorthents, loamy

Setting

Landscape: Mostly uplands and terraces where natural soil has been excavated or covered by earthy fill material
Landform: Variable; commonly depressional areas or broad flats in urban areas
Shape of areas: Irregularly shaped
Size of areas: 2 to 100 acres

Composition

Udorthents and similar inclusions: 90 percent
Dissimilar inclusions: 10 percent

Typical Profile

Udorthents consist of cut and fill areas where soil material has been removed and placed on an adjacent site and, to a lesser extent, borrow pits and recreational areas, such as a running track. A typical profile is not given due to the variable nature of the soil material.

Soil Properties and Qualities

Depth class: Deep or very deep
Drainage class: Well drained or moderately well drained
Permeability: Moderate to slow
Available water capacity: Low to high
Depth to seasonal high water table: Variable; commonly more than 6 feet
Hazard of flooding: Variable; commonly none or rare
Shrink-swell potential: Low
Surface runoff: Medium or rapid
Hazard of water erosion: Moderate or severe
Slope class: Commonly nearly level or gently sloping; very steep or nearly vertical on some sides of borrow pits
Organic matter content: Low
Natural fertility: Low
Reaction: Extremely acid to moderately acid, except where surface layers have been limed
Parent material: Loamy fill material
Depth to bedrock: More than 40 inches

Inclusions

Dissimilar inclusions:
• Random areas of Udorthents that have bedrock at a depth of less than 40 inches
• Poorly drained or very poorly drained soils in depressions
• Areas of Udorthents adjacent to streams that are subject to frequent or occasional flooding
• Areas of Udorthents that contain asphalt, wood, glass, and other waste materials
• Areas of Udorthents that have stone-sized rock fragments on the surface

Similar inclusions:
• Soils that are similar to Udorthents and that have clayey or sandy underlying material

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

VaB—Vance sandy loam, 2 to 6 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Convex knolls and ridges
Shape of areas: Rounded or irregularly shaped
Size of areas: 10 to 30 acres

Composition

Vance soil and similar inclusions: 90 percent
Dissimilar inclusions: 10 percent

Typical Profile

Surface layer:
0 to 9 inches—yellowish brown sandy loam

Subsoil:
9 to 25 inches—brownish yellow clay that has red mottles
25 to 39 inches—brownish yellow clay that has red, yellow, and pale brown mottles
39 to 60 inches—brownish yellow clay loam that has red, yellow, and white mottles

Underlying material:
60 to 80 inches—multicolored sandy clay loam saprolite in shades of red, brown, yellow, and white

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: High
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Moderate
Surface runoff: Medium
Hazard of water erosion: Moderate
Slope class: Gently sloping
Organic matter content: Low
Natural fertility: Low
Reaction: Very strongly acid to moderately acid in the A horizon, except where limed, and very strongly acid or strongly acid in the B and C horizons
Parent material: Residuum weathered from felsic intrusive rocks
Depth to bedrock: More than 60 inches

Inclusions

Dissimilar inclusions:
- The moderately well drained Helena soils in depressions
- Random areas of the moderately permeable Appling soils
- Random areas of the moderately permeable Cecil soils that have a subsoil that is redder than that of the Vance soil; on broad ridges
- Random areas of eroded Vance soils that have a surface layer of clay loam

Similar inclusions:
- Vance soils that have a surface layer of coarse sandy loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

VaC—Vance sandy loam, 6 to 10 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Narrow hill slopes
Shape of areas: Rounded to long or irregularly shaped
Size of areas: 5 to 10 acres

Composition

Vance soil and similar inclusions: 70 percent
Dissimilar inclusions: 30 percent

Typical Profile

Surface layer:
0 to 4 inches—dark brown sandy loam

Subsoil:
4 to 24 inches—yellowish red clay
24 to 30 inches—yellowish red clay that has red and brownish yellow mottles
30 to 48 inches—brownish yellow clay loam that has yellowish red and reddish brown mottles

Underlying material:
48 to 62 inches—multicolored sandy clay loam saprolite in shades of red, yellow, and white

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Available water capacity: High
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Moderate
Surface runoff: Medium
Hazard of water erosion: Severe
Slope class: Moderately sloping
Organic matter content: Low
Natural fertility: Low
Reaction: Very strongly acid to moderately acid throughout the profile, except where surface layers have been limed
Parent material: Residuum weathered from felsic intrusive rocks
Depth to bedrock: More than 60 inches

Inclusions

Dissimilar inclusions:
- The moderately well drained Helena soils on the lower hill slopes
- Random areas of the moderately permeable Appling soils
- Random areas of the moderately permeable Cecil soils that have a subsoil that is redder than that of the Vance soil; on broad ridges
- Random areas of eroded Vance soils that have a surface layer of clay loam

Similar inclusions:
- Vance soils that have a surface layer of coarse sandy loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

WaE—Wateree-Rion-Wedowee complex, 15 to 30 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Wateree—the lower hill slopes; Rion—the upper and middle parts of hill slopes; Wedowee—hill slopes
Shape of areas: Long and narrow or irregularly shaped
Size of areas: 5 to 10 acres

Composition

Wateree soil and similar inclusions: 35 percent
Rion soil and similar inclusions: 30 percent
Wedowee soil and similar inclusions: 20 percent
Dissimilar inclusions: 15 percent

Typical Profile

Wateree

Surface layer:
0 to 4 inches—brown sandy loam

Subsoil:
4 to 21 inches—yellowish brown sandy loam

Underlying material:
21 to 37 inches—very pale brown coarse sandy loam saprolite

Bedrock:
37 to 62 inches—weathered multicolored granite

Rion

Surface layer:
0 to 8 inches—brown sandy loam
8 to 14 inches—yellowish brown sandy loam

Subsurface layer:
14 to 20 inches—brownish yellow sandy loam

Subsoil:
20 to 38 inches—brownish yellow sandy clay loam
38 to 55 inches—reddish yellow sandy loam

Underlying material:
55 to 72 inches—strong brown coarse sandy loam saprolite

Bedrock:
72 to 74 inches—weathered multicolored schist

Wedowee

Surface layer:
0 to 8 inches—dark brown sandy loam

Subsurface layer:
8 to 12 inches—brownish yellow sandy loam

Subsoil:
12 to 20 inches—strong brown clay loam
20 to 35 inches—strong brown sandy clay

Underlying material:
35 to 62 inches—multicolored sandy loam saprolite in shades of red, brown, and yellow

Soil Properties and Qualities

Depth class: Wateree—moderately deep; Rion and Wedowee—very deep
Drainage class: Well drained
Permeability: Wateree—moderately rapid; Rion and Wedowee—moderate
Available water capacity: Moderate
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Low
Surface runoff: Rapid
Hazard of water erosion: Very severe
Slope class: Moderately steep or steep
Organic matter content: Low
Natural fertility: Low
Reaction: Wateree—very strongly acid to moderately acid in the A and B horizons, except where surface layers have been limed, and extremely acid to moderately acid in the C horizon; Rion—very strongly acid to slightly acid throughout the profile, except where surface layers have been limed; Wedowee—extremely acid to strongly acid throughout the profile, except where surface layers have been limed
Parent material: Residuum weathered from felsic intrusive rocks
Depth to bedrock: Wateree—20 to 40 to soft bedrock and 40 to more than 60 inches to hard bedrock; Rion and Wedowee—more than 60 inches

Inclusions

Dissimilar inclusions:
- Random areas of Pacolet soils that have a red clayey subsoil
- Poorly drained and somewhat poorly drained soils that have a loamy subsoil; in the lower landform positions
- Soils that have a loamy subsoil and have hard bedrock within a depth of 20 inches
- Soils that have cobble-sized or larger fragments on the surface
- Soils that have widely scattered areas of rock outcrops
- Random areas of eroded soils that have a surface layer of clay loam or sandy clay loam

Similar inclusions:
• Wateree, Rion, and Wedowee soils that have a surface layer of loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

WeC—Wedowee sandy loam, 6 to 10 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Narrow hill slopes
Shape of areas: Long or irregularly shaped
Size of areas: 5 to 10 acres

Composition

Wedowee soil and similar inclusions: 75 percent
Dissimilar inclusions: 25 percent

Typical Profile

Surface layer:
0 to 8 inches—dark brown sandy loam

Subsurface layer:
8 to 12 inches—brownish yellow sandy loam

Subsoil:
12 to 20 inches—strong brown clay loam
20 to 35 inches—strong brown sandy clay loam

Underlying material:
35 to 65 inches—multicolored sandy loam saprolite in shades of red, brown, and yellow

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Medium
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Low
Surface runoff: Medium
Hazard of water erosion: Severe
Slope class: Strongly sloping
Organic matter content: Low
Natural fertility: Low
Reaction: Extremely acid to strongly acid throughout the profile, except where surface layers have been limed
Parent material: Residuum weathered from felsic intrusive rocks
Depth to bedrock: More than 60 inches

Inclusions

Dissimilar inclusions:
• The slowly permeable Vance soils on the slightly higher knolls
• Random areas of soils that have a loamy subsoil and have soft bedrock at a depth of 20 to 40 inches
• Random areas of soils that have stones or boulders on the surface
• Random areas of eroded Wedowee soils that have a surface layer of clay loam or sandy clay loam

Similar inclusions:
• Wedowee soils that have a surface layer of loam, fine sandy loam, or coarse sandy loam

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

WeD—Wedowee sandy loam, 10 to 15 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Side slopes adjacent to major drainageways
Shape of areas: Long and narrow; roughly rectangular
Size of areas: 2 to 8 acres

Composition

Wedowee soil and similar inclusions: 75 percent
Dissimilar inclusions: 25 percent

Typical Profile

Surface layer:
0 to 3 inches—dark brown sandy loam

Subsurface layer:
3 to 9 inches—light yellowish brown sandy loam

Subsoil:
9 to 12 inches—reddish yellow sandy clay loam
12 to 30 inches—strong brown clay
30 to 36 inches—mottled strong brown and very pale brown clay loam

Underlying material:
36 to 60 inches—mottled strong brown, very pale brown, and white silt loam saprolite

Soil Properties and Qualities

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Available water capacity: Medium
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Low
Surface runoff: Rapid
Hazard of water erosion: Severe
Slope class: Moderately steep
Organic matter content: Low
Natural fertility: Low
Reaction: Extremely acid to strongly acid throughout the profile, except where surface layers have been limed
Parent material: Residuum weathered from felsic intrusive rocks
Depth to bedrock: More than 60 inches

Inclusions

Dissimilar inclusions:
• Random areas of soils that have stones or boulders on the surface
• Random areas of eroded Wedowee soils that have a surface layer of clay loam or sandy clay loam
• Nason soils that have a higher content of silt in the subsoil than the Wedowee soil and have soft bedrock at a depth of 40 to 60 inches

Use and Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

WxE—Wilkes sandy loam, 10 to 25 percent slopes

Setting

Landscape: Piedmont uplands
Landform: Side slopes adjacent to major drainageways
Shape of areas: Narrow bands; roughly rectangular
Size of areas: 2 to 10 acres

Composition

Wilkes soil and similar inclusions: 75 percent
Dissimilar inclusions: 25 percent

Typical Profile

Surface layer:
0 to 3 inches—grayish brown sandy loam

Subsurface layer:
3 to 6 inches—light brownish gray sandy loam

Subsoil:
6 to 10 inches—yellowish brown clay
10 to 13 inches—yellowish brown clay loam

Bedrock:
13 to 48 inches—weathered multicolored fractured diabase
48 inches—hard unweathered diabase

Soil Properties and Qualities

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately slow
Available water capacity: Low
Depth to seasonal high water table: More than 6 feet
Shrink-swell potential: Moderate
Surface runoff: Rapid
Hazard of water erosion: Severe
Slope class: Strongly sloping or moderately steep
Organic matter content: Low
Natural fertility: Medium
Reaction: Strongly acid to slightly acid in the upper part of the profile and moderately acid to mildly alkaline in the lower part
Parent material: Residuum weathered from mixed acidic and basic rocks
Depth to bedrock: Less than 20 inches to soft bedrock and 40 to more than 60 inches to hard bedrock

Inclusions

Dissimilar inclusions:
• Random areas of soils that have many stones on the surface
• Areas of soils that have bedrock below a depth of 20 inches

Management

For general and detailed information about managing this map unit, see the section “Use and Management of the Soils.”

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section can be used to plan the use and management of soils as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, lawns, and trees and shrubs.

Federal and State regulations require that any area designated as wetlands cannot be altered without prior approval. Contact the local office of the Natural Resources Conservation Service for identification of hydric soils and potential wetlands.

Hydric Soils

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and hydrology *(5, 6, 10, 11)*. Areas identified as wetlands must meet criteria for each of the characteristics. Undrained hydric soils that have natural vegetation support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses are capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the profile *(7)*. These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. To determine whether a specific soil is a hydric or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Criteria which identify the estimated soil properties that are unique to hydric soils have been established *(8)*. These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria are selected estimated soil properties, which are described in “Soil Taxonomy” *(14, 17)* and in the “Soil Survey Manual” *(16)*.

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators that can be used to make onsite determinations of hydric soils in Camp Butner are specified in “Field Indicators of Hydric Soils in the United States” *(9)*.

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. The determination of an appropriate indicator may require a greater depth. Soil scientists excavate and describe the soils deep enough to understand the redoximorphic processes. After completing the soil description, soil scientists can compare the soil features required by each indicator and the conditions observed in the soil and determine which indicators occur. The soil can be identified as a hydric soil if one or more of the approved indicators occur.

This survey can be used to locate probable areas of hydric soils, but onsite investigation is needed to determine the occurrence of hydric soils on a specific site *(9, 10)*.

The Wehadkee part of the map unit Chewacla and Wehadkee soils, 0 to 2 percent slopes, frequently flooded, meets the requirements for hydric soils and also has at least one of the hydric soil indicators. It meets the saturation and flooding criteria.

Map units consisting of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions of the landform, and map units consisting of nonhydric soils may have inclusions of hydric soils in the lower positions of the landform.

The map unit Lignum silt loam, 2 to 6 percent slopes, generally does not meet the requirements for hydric soils because it does not have one of the hydric soil indicators. A portion of this map unit, however, may include hydric soils. Onsite investigation is needed to determine whether or not hydric soils occur and the location of included hydric soils.

Woodland Management and Productivity

Owners of woodland have many objectives. These objectives include producing timber; conserving wildlife, soil, and water (fig. 6); preserving esthetic values; and providing opportunities for recreational activities, such as commercial hunting. Public demand for clean water and recreational areas creates pressures and opportunities for owners of woodland.

The landowner interested in timber production is faced with the challenge of producing greater yields from smaller areas. Meeting this challenge requires intense management and silvicultural practices. Many modern silvicultural techniques resemble those long practiced in agriculture. They include establishing and thinning a desirable young stand; propagating the more productive species and genetic varieties; providing short rotations and complete fiber utilization; and controlling insects and diseases. Even though timber crops require decades to grow, the goal of intensive management is similar to the goal of intensive agriculture. This goal is to produce the greatest yield of the most valuable crop as quickly as possible.

Commercial forest is land that is producing or is capable of producing crops of industrial wood and that has not been withdrawn from timber production. Loblolly pine is the most important timber species in the survey area because it grows fast, is adapted to the soil and climate, brings the highest average sale value per acre, and is easy to establish and manage (fig. 7).

Pines are important to the furniture industry and as sawtimber for home construction. Hardwoods have become increasingly valuable for lumber production, as hardwood flooring, veneers, and tool handles, and as pulp for the paper industry. Chips and smaller wood pieces are used for pulp paper and composite wood products, such as waferboard used in the building industry. Chips, bark, dust, and residues are used as pulp and for landscaping.

For purposes of forest inventory, the predominant forest types are described in the following paragraphs *(12)*.

Loblolly-shortleaf. This forest type is predominantly loblolly pine, shortleaf pine, or other kinds of southern yellow pine (excluding longleaf pine and slash pine) or a combination of these species. Commonly included trees are oak, hickory, and gum.

Oak-pine. This forest type is predominantly hardwoods, usually upland oaks. Pine species make up 25 to 50 percent of the stand. Commonly included trees are gum, hickory, and yellow-poplar.

Oak-hickory. This forest type is predominantly upland oaks or hickory, or both. Commonly included trees are yellow-poplar, elm, maple, and black walnut.

Oak-gum-cypress. This forest type is bottom-land forest consisting predominantly of tupelo, blackgum, sweetgum, oaks, southern cypress, or a combination of these species. Commonly included trees are cottonwood, willow, ash, elm, hackberry, and maple.

Elm-ash-cottonwood. This forest type is predominantly elm, ash, cottonwood, or a combination of these species. Commonly included trees are willow, sycamore, beech, and maple.

One of the first steps in planning intensive woodland management is to determine the potential productivity of the soil for several alternative tree species. The most productive and valued trees are then selected for each soil type. Site and yield information enables a forest manager to estimate future wood supplies. These estimates are the basis of realistic decisions concerning expenses and profits associated with intensive woodland management, land acquisition, or industrial investments.

Figure 6.—The entrance to Camp Butner. Because much of the camp has remained wooded, excellent wildlife habitat is available away from the firing ranges.

Figure 7.—Timber harvest in an area of Helena soils. Soils in Camp Butner are highly productive for the management of loblolly pine. Limiting harvesting operations to dry periods minimizes rutting and compaction.

The potential productivity of woodland depends on physiography, soil properties, climate, and the effects of past management. Specific soil properties and site characteristics, including soil depth, texture, structure, and depth to the water table, affect forest productivity primarily by influencing available water capacity, aeration, and root development. The net effects of the interaction of these soil properties and site characteristics determine the potential site productivity.

Other site factors are also important. The gradient and length of slopes affect water movement and availability. The amount of rainfall and length of growing season influence site productivity.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to applications of fertilizer than others, and some are more susceptible to erosion after roads are built and timber is harvested. Some soils require special reforestation efforts. Table 2 summarizes this forestry information and rates the soils for a number of factors to be considered in management. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce in a pure stand under natural conditions. The number 1 indicates low potential productivity; 2 or 3, moderate; 4 or 5, moderately high; 6 to 8, high; 9 to 11, very high; and

12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excess water in or on the soil; *T*, toxic substances in the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; *F*, a high content of rock fragments in the soil; *L*, low strength; and *N*, snowpack. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, F, L, and N.

In table 2, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *volume* number. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *volume*, a number, is the yield likely to be produced by the most important trees. This number,

expressed as cubic feet per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

Trees to plant are those that are suitable for commercial wood production.

Recreation

In table 3, the soils of the survey area are rated according to the limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 3, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 3 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 6 and interpretations for dwellings without basements and for local roads and streets in table 5.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have gentle slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes, stones, or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Wildlife Habitat

Camp Butner has a diversity of wildlife habitat. It provides habitat particularly suited to small game species, such as quail, rabbit, dove, and squirrel. Soils throughout the camp are generally well suited to the establishment and growth of most native and introduced plants used for wildlife food and cover.

Deer and turkey are the largest species in the survey area. Corn, soybeans, and forage grasses provide an abundant food supply for deer. Deer use areas of cover crops during winter. Densely wooded areas of Wehadkee soils on flood plains support good vegetative cover for deer. Turkey inhabit the camp to a lesser extent than deer. Turkey mainly inhabit areas of the less accessible hardwood tracts.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water (fig. 8). Wildlife habitat can be created or improved by planting the appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants (fig. 9). Generally, native plants provide the best source of food and cover for wildlife.

In table 4, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for

Figure 8.—A portion of Lake Butner, located on the western edge of the camp. The lake is a good source of fishing. Limiting soil disturbance around the lake helps to maintain water quality.

each element of the habitat. The ratings in the table are intended to be used as a guide and are not site specific. Onsite investigation is needed for individual management plans.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and

Figure 9.—One of the many entrance signs located on access roads into the camp. The vegetation, consisting of loblolly pine and mixed hardwoods, is part of a natural area that provides excellent wildlife habitat.

legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, and pokeberry.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are autumn-olive and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cattail, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, meadowlark, field sparrow, cottontail rabbit, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and whitetail deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability,

corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil map, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 5 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock or a very firm, dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the high water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. Depth to a high water table, depth to bedrock, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock, depth to a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, depth to a high water table, depth to bedrock, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established. Soil tests are essential to determine liming and fertilizer needs. Help in making soil tests or in deciding what soil additive, if any, should be used can be obtained from the local office of the Cooperative Extension Service.

Sanitary Facilities

Table 6 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if

soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 6 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and that good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, depth to a high water table, depth to bedrock, and flooding affect absorption of the effluent. Large stones and bedrock interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. The animal waste lagoons commonly used in farming operations are not considered in the ratings. They are generally deeper than the lagoons referred to in the table and rely on anaerobic bacteria to decompose waste materials.

Table 6 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, depth to a high water table, depth to bedrock, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope or bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 6 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil

material remaining in the borrow area must be thick enough over bedrock or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 7 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the high water table is more than 3 feet. Soils rated *fair* have more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the high water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a high water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 7, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale, siltstone, and weathered granite saprolite, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a high water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a high water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are naturally fertile or respond well to fertilizer and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel or stones, or

soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel or stones, have slopes of more than 15 percent, or have a high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 8 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives the restrictive features that affect each soil for drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area. Ponds that are less than about 2 acres in size are not shown on the map because of the scale of mapping.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, mica, or salts or sodium. Depth to a high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table and permeability of the aquifer. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock or to other layers that affect the rate of water movement, permeability, depth to a high water table or depth of standing water if the soil is subject to ponding, slope, susceptibility to flooding, subsidence of organic layers, and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Drainage may be a major management consideration in some areas. Management of drainage in conformance with regulations concerning wetlands may require special permits and extra planning. The local office of the Natural Resources Conservation Service should be contacted for identification of hydric soils and potential wetlands.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to a high water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock. The performance of a system is affected by the availability of suitable irrigation water, the depth of the root zone, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve

moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock affect the construction of grassed waterways. A hazard of soil blowing, a low available water capacity, restricted rooting depth, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil map. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 9 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading “Soil Series and Their Morphology.”

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages, by weight, of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. “Loam,” for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, by volume, an appropriate modifier is added, for example, “gravelly.” Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SC-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20, or higher, for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Tables 10 and 11 show estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate, or component, consists of mineral soil particles that are less than 0.002 millimeter in diameter. In table 10, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence the shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. This term has traditionally been used in soil surveys to indicate saturated hydraulic conductivity (Ksat). The estimates indicate the rate of movement of water through the soil when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage in each major soil layer is stated in inches of water per inch of soil. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time. It is the difference between the amount of soil water at field moisture capacity and the amount at wilting point.

Linear extensibility, expressed as a percent, is the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state ($^1/_3$- or $^1/_{10}$-bar water content to oven dryness). The volume change is reported as percent change for the whole soil. Linear extensibility is used to determine shrink-swell potential classes for soils. If the soil has a linear extensibility of less than 3 percent, the shrink-swell potential is low; 3 to 6 percent, the shrink-swell potential is moderate; 6 to 9 percent, the shrink-swell potential is high; and more than 9 percent, the shrink-swell potential is very high.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 10, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily

on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.64. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons per acre per year.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing. The soils assigned to group 1 are the most susceptible to soil blowing, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.
8. Soils that are not subject to soil blowing because of coarse fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year than can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

In table 11, *effective cation-exchange capacity* is the sum of extractable bases plus aluminum and is used for soils that have pH of less than 5.5. It is a measure of cation-exchange capacity that is particularly useful for soils whose ion-exchange capacity is largely a result of variable charge components, such as allophane, kaolinite, hydrous iron and aluminum oxides, and organic matter. In these soils, the cation-exchange capacity is not a fixed number but a function of pH.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Soil and Water Features

Tables 12 and 13 give estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. In table 12, they are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep or very deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep to very deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These

consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups in table 12, the first letter is for drained areas and the second is for undrained areas.

Water table (high) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. Indicated in table 12 are the upper and lower limits of the water table. A water table that is seasonally high for less than 1 month is not indicated in table 12.

Two numbers in the column showing the upper limit of the water table indicate the normal range in depth to a saturated zone. Numbers in the column showing the lower limit indicate the depth to the base of the water table. Depth is given to the nearest half foot. The first numeral in the range in the column showing the upper limit indicates the highest water level. A plus sign preceding the range in depth in this column indicates that the water table is above the surface of the soil. "More than 5.0" in this column indicates that the water table is below a depth of 5 feet or that it is within a depth of 5 feet for less than a month. "More than 5.0" in the column showing the lower limit indicates that the base of the water table is below a depth of 5 feet.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 12 gives the duration and frequency of flooding for each month. Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as none, rare, occasional, or frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month.

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered is local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

In table 13, a *restrictive layer* is described if it occurs within a depth of 5 feet. The depth of the layer is based on many soil borings and on observations during soil mapping. If the restrictive layer is rock, the rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the high water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and the amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(14)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or on laboratory measurements. Table 14 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Ultisol.

SUBORDER. Each order is divided into suborders, primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udult (*Ud*, meaning humid climate, plus *ult*, from Ultisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludults (*Hapl*, meaning minimal horizon development, plus *udult*, the suborder of the Ultisols that occurs in humid climates).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Hapludults.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, semiactive, thermic Typic Hapludults.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. There can be some variation in the texture of the surface layer or of the underlying material within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The location of the typical pedon is described, and coordinates generally are identified by the State plane grid system and by longitude and latitude. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" *(16)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(14)* and in "Keys to Soil Taxonomy" *(17)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Appling Series

Depth class: Very deep
Drainage class: Well drained

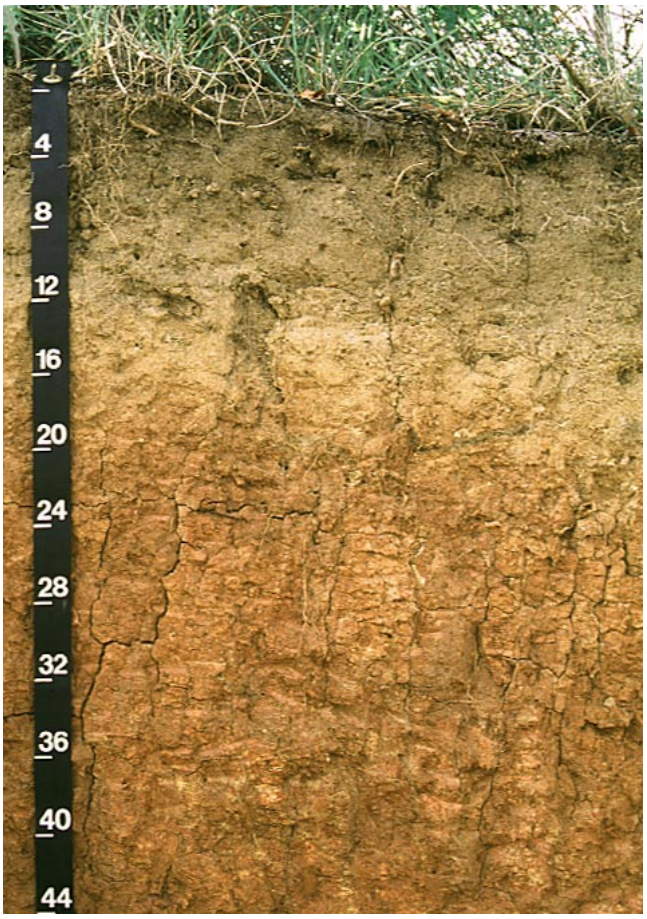

Figure 10.—A profile of Appling soils. These soils are well suited to most uses. They occur in the northwestern part of the camp, but the acreage of these soils is low.

Permeability: Moderate
Parent material: Residuum weathered from felsic intrusive rocks
Landscape: Piedmont uplands (fig. 10)
Landform: Ridges and hill slopes
Slope: 2 to 10 percent
Taxonomic class: Fine, kaolinitic, thermic Typic Kanhapludults

Typical Pedon

Appling sandy loam, 2 to 6 percent slopes; 200 feet northwest of the intersection of Secondary Road 1602 and Henderson Street in Oxford, 100 feet east of a large farm pond, in a stand of loblolly pine; Oxford USGS topographic quadrangle; lat. 36 degrees 18 minutes 36 seconds N. and long. 78 degrees 34 minutes 26 seconds W.

Ap—0 to 6 inches; yellowish brown (10YR 5/4) sandy loam; weak fine granular structure; very friable; slightly sticky, nonplastic; many fine and coarse roots; moderately acid; clear smooth boundary.

E—6 to 11 inches; yellowish brown (10YR 5/4) sandy loam; weak fine subangular blocky structure; firm; slightly sticky, nonplastic; many fine and coarse roots; moderately acid; clear wavy boundary.

Bt1—11 to 23 inches; yellowish red (5YR 4/6) clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate coarse subangular blocky structure; firm; slightly sticky, moderately plastic; many fine roots; many distinct clay films on faces of peds and along root channels; very strongly acid; gradual wavy boundary.

Bt2—23 to 35 inches; yellowish red (5YR 4/6) clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; moderate coarse subangular blocky structure; firm; slightly sticky, moderately plastic; many fine roots; common faint clay films on faces of peds; strongly acid; gradual wavy boundary.

BC1—35 to 41 inches; yellowish red (5YR 4/6) clay loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; slightly sticky, moderately plastic; very strongly acid; gradual wavy boundary.

BC2—41 to 65 inches; yellowish red (5YR 4/6) sandy clay loam; few medium distinct very pale brown (10YR 7/3) mottles; weak fine subangular blocky structure; friable; slightly sticky, moderately plastic; very strongly acid.

Range in Characteristics

Thickness of the solum: 40 to more than 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: None to common in the A, E, and Bt horizons and none to many in the BC horizon
Content and size of rock fragments: Less than 15 percent, by volume, in the A horizon and less than 10 percent in the B horizon; mostly gravel
Reaction: Very strongly acid or strongly acid throughout the profile, except where surface layers have been limed

Ap or A horizon:
Color—hue of 5YR to 2.5Y, value of 3 to 6, and chroma of 2 to 6
Texture—sandy loam

E horizon:
Color—hue of 5YR to 2.5Y and value and chroma of 4 to 6
Texture—loamy coarse sand, loamy sand, coarse sandy loam, sandy loam, or fine sandy loam

Bt horizon:
Color—hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8
Mottles—shades of red, brown, or yellow
Texture—clay loam, sandy clay, or clay having some thin layers of sandy clay loam

BC horizon:
Color—hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8
Mottles—shades of red, brown, or yellow
Texture—sandy clay, clay loam, or sandy clay loam

C horizon (if it occurs):
Color—multicolored in shades of red, brown, yellow, or white
Texture—variable; commonly sandy loam, loam, clay loam, or sandy clay loam saprolite

Cecil Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Residuum weathered from felsic intrusive rocks
Landscape: Piedmont uplands (fig. 11)
Landform: Ridges and hill slopes
Slope: 2 to 10 percent
Taxonomic class: Fine, kaolinitic, thermic Typic Kanhapludults

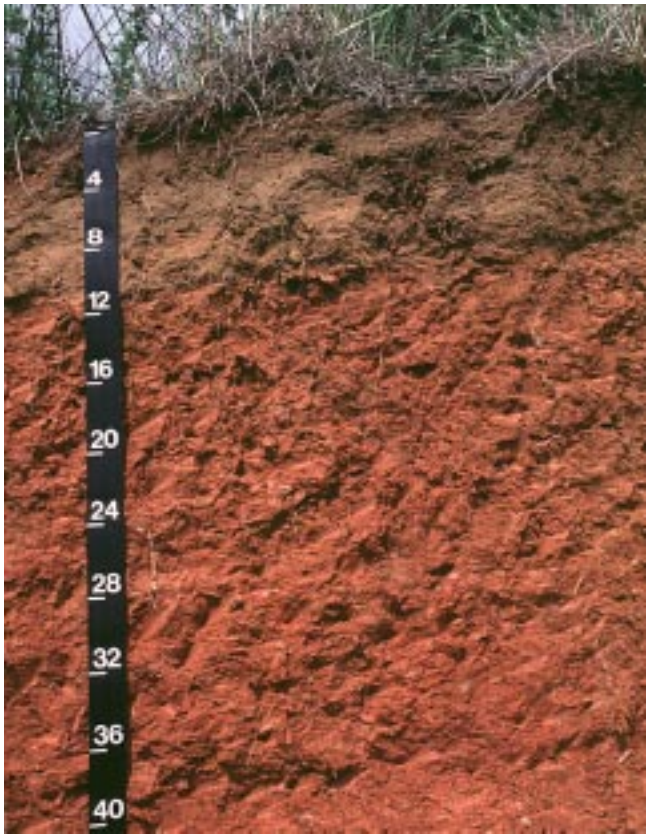

Figure 11.—A profile of Cecil soils. These soils have few limitations for most uses. The acreage of these soils in the survey area is very limited.

Typical Pedon

Cecil sandy loam, 2 to 6 percent slopes; 0.75 mile north of Wilton on North Carolina Highway 96, about 1.25 miles east on Secondary Road 1623, about 500 feet east on Secondary Road 1625, about 100 feet south of Grove Hill Church, in a pasture; Wilton USGS topographic quadrangle; lat. 36 degrees 10 minutes 00 seconds N. and long. 78 degrees 31 minutes 29 seconds W.

Ap—0 to 8 inches; strong brown (7.5YR 5/4) sandy loam; weak fine granular structure; very friable; slightly acid; abrupt smooth boundary.
Bt1—8 to 24 inches; red (2.5YR 4/8) clay; few fine prominent red (10R 4/8) and common fine prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; moderately sticky, moderately plastic; few faint clay films on faces of peds; moderately acid; gradual wavy boundary.
Bt2—24 to 40 inches; red (2.5YR 4/8) clay; few medium prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; firm; moderately sticky, moderately plastic; few faint clay films on faces of peds; moderately acid; gradual wavy boundary.
BC—40 to 55 inches; red (2.5YR 4/8) clay loam; common medium pale yellow and white pockets of sandy loam saprolite; weak medium subangular blocky structure; friable; slightly sticky, slightly plastic; strongly acid; gradual wavy boundary.
C—55 to 65 inches; multicolored sandy loam saprolite in shades of red, yellow, and white; massive; friable; strongly acid.

Range in Characteristics

Thickness of the solum: 40 to more than 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: None to common in the Bt horizon and none to many in the BC and C horizons
Content and size of rock fragments: Less than 15 percent, by volume, in the A horizon and less than 10 percent in the B horizon; mostly gravel and cobbles

Reaction: Very strongly acid to moderately acid in the A horizon, except where limed, and strongly acid or very strongly acid in the B and C horizons

Ap or A horizon:
Color—hue of 2.5YR to 10YR, value of 3 to 5, and chroma of 2 to 8
Texture—sandy loam or clay loam

Bt horizon:
Color—commonly hue of 10R or 2.5YR, value of 4 or 5, and chroma of 6 to 8; also hue of 5YR in areas where mottles do not occur
Mottles—shades of red, brown, or yellow
Texture—clay loam, sandy clay, or clay

BC horizon:
Color—hue of 10R to 5YR, value of 4 to 6, and chroma of 4 to 8
Mottles—shades of yellow or brown
Texture—loam, sandy clay loam, or clay loam

C horizon:
Color—multicolored in shades of red, brown, yellow, white, or gray
Texture—variable; commonly sandy loam, loam, clay loam, or sandy clay loam saprolite

Chewacla Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Recent alluvial sediments
Landscape: Piedmont drainageways
Landform: Flood plains
Slope: 0 to 2 percent
Taxonomic class: Fine-loamy, mixed, active, thermic Fluvaquentic Dystrudepts

Typical Pedon

Chewacla loam in an area of Chewacla and Wehadkee soils, 0 to 2 percent slopes, frequently flooded; 0.5 mile east of the Durham-Granville County line on Secondary Road 1004, about 500 feet south of Secondary Road 1004, in an area of woodland; Lake Mitchie USGS topographic quadrangle; lat. 36 degrees 07 minutes 58 seconds N. and long. 78 degrees 48 minutes 04 seconds W.

A—0 to 6 inches; yellowish brown (10YR 4/4) loam; weak fine granular structure; very friable; few fine flakes of mica; slightly acid; clear wavy boundary.
Bw1—6 to 15 inches; yellowish brown (10YR 4/4) loam; weak fine and medium subangular blocky structure; very friable; few fine flakes of mica; slightly acid; clear smooth boundary.
Bw2—15 to 19 inches; dark yellowish brown (10YR 4/4) loam; weak fine and medium subangular blocky structure; friable; few fine distinct pale brown (10YR 6/3) irregularly shaped masses of iron accumulation with clear boundaries throughout; few fine flakes of mica; slightly acid; gradual wavy boundary.
C—19 to 33 inches; dark brown (10YR 4/3) loam; massive; friable; common medium distinct gray (10YR 5/1) irregularly shaped iron depletions with clear boundaries in the matrix; few fine flakes of mica; slightly acid; gradual wavy boundary.
Cg—33 to 65 inches; light brownish gray (10YR 6/2) sandy loam; massive; very friable; common medium distinct yellowish brown (10YR 5/4) irregularly shaped masses of iron accumulation with clear boundaries throughout; few fine flakes of mica; strongly acid.

Range in Characteristics

Thickness of the solum: 15 to 70 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: Few or common
Content and size of rock fragments: Less than 5 percent, by volume, in the A horizon and the upper part of the B horizon; mostly gravel or cobbles
Reaction: Very strongly acid to slightly acid in the upper 40 inches, except where surface layers have been limed, and very strongly acid to slightly alkaline below a depth of 40 inches

A horizon:
Color—hue of 5YR to 10YR, value of 3 to 5, and chroma of 1 to 4
Texture—loam

Bw horizon:
Color—hue of 5YR to 2.5Y, value of 4 to 7, and chroma of 3 to 8
Texture—sandy loam, fine sandy loam, loam, sandy clay loam, clay loam, silt loam, or silty clay loam
Redoximorphic features—iron or clay depletions in shades of gray or brown and masses of iron accumulation in shades of yellow, brown, or red

C horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 3 to 8
Texture (within a depth of 40 inches)—loamy
Texture (below a depth of 40 inches)—variable; ranging from extremely gravelly sand to clay
Redoximorphic features—iron or clay depletions in

shades of gray or brown and masses of iron accumulation in shades of yellow, brown, or red

Cg horizon:
Color—horizon is neutral in hue or has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 0 to 2
Texture (within a depth of 40 inches)—loamy
Texture (below a depth of 40 inches)—variable; ranging from extremely gravelly sand to clay
Redoximorphic features—masses of iron accumulation in shades of yellow, brown, or red

Georgeville Series

Depth class: Very deep (fig. 12)
Drainage class: Well drained
Permeability: Moderate
Parent material: Residuum weathered from mixed felsic and mafic volcanic rocks
Landscape: Piedmont uplands
Landform: Ridges and hill slopes
Slope: 2 to 10 percent
Taxonomic class: Fine, kaolinitic, thermic Typic Hapludults

Typical Pedon

Georgeville silt loam, 2 to 6 percent slopes; 5 miles north of Oxford on U.S. Highway 15, about 50 feet northeast on Secondary Road 1427, in a pasture; Stovall USGS topographic quadrangle; lat. 36 degrees 27 minutes 26 seconds N. and long. 78 degrees 36 minutes 24 seconds W.

Ap—0 to 8 inches; strong brown (7.5YR 5/6) silt loam; weak medium granular structure; very friable; strongly acid; abrupt smooth boundary.
Bt1—8 to 24 inches; red (2.5YR 4/8) clay; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; few faint clay films on faces of peds; strongly acid; gradual wavy boundary.
Bt2—24 to 37 inches; red (2.5YR 4/6) clay; few fine distinct reddish yellow (7.5YR 6/8) mottles; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; few faint clay films on faces of peds; strongly acid; gradual wavy boundary.
Bt3—37 to 50 inches; red (2.5YR 5/8) clay loam; few fine distinct reddish yellow (7.5YR 5/8) mottles; moderate fine subangular blocky structure; friable; slightly sticky, slightly plastic; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Figure 12.—A profile of Georgeville soils. These soils are very deep and do not have bedrock within a depth of 60 inches. Because of the high content of silt, erosion can be a problem where the surface is left unprotected. These soils occur in scattered areas throughout the camp but mainly occur in the southern and northeastern parts.

BC—50 to 62 inches; red (2.5YR 4/8) clay loam; common fine distinct reddish yellow (7.5YR 6/8) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.
C—62 to 72 inches; red (2.5YR 4/8) silt loam saprolite; common fine distinct reddish yellow (7.5YR 6/8) mottles; massive; very friable; very strongly acid.

Range in Characteristics

Thickness of the solum: 40 to more than 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: None or few in the lower part of the B horizon
Content and size of rock fragments: Less than 15

Figure 13.—A profile of Helena soils. These soils have the most extensive acreage in Camp Butner. Large areas occur in the western and southern parts of the camp. Limitations of these soils are associated with a perched water table, which is caused by the heavy clay subsoil. The soils also have a severe shrink-swell potential.

percent, by volume, in the A horizon and less than 10 percent in the B and C horizons; mostly gravel

Reaction: Very strongly acid to moderately acid in the A horizon, except where surface layers have been limed, and very strongly acid or strongly acid in the B and C horizons

A or Ap horizon:
- Color—horizon is neutral in hue or has hue of 5YR to 2.5Y, value of 4 or 5, and chroma of 0 to 8
- Texture (fine-earth fraction)—silt loam

Bt horizon:
- Color—hue of 10R or 2.5YR, value of 4 or 5, and chroma of 6 to 8
- Mottles—shades of brown or yellow
- Texture—clay loam, silty clay loam, or clay

BC horizon:
- Color—hue of 10R to 5YR, value of 4 or 5, and chroma of 6 to 8
- Mottles—shades of brown or yellow
- Texture—loam, clay loam, silt loam, or silty clay loam

C horizon:
- Color—hue of 10R to 10YR, value of 4 to 6, and chroma of 3 to 8
- Mottles—shades of red, brown, yellow, or red
- Texture—sandy loam, fine sandy loam, very fine sandy loam, loam, or silt loam saprolite

Helena Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Parent material: Residuum weathered from felsic intrusive rocks
Landscape: Piedmont uplands (fig. 13)
Landform: Interstream divides, heads of drainageways, depressions, and the lower hill slopes
Slope: 2 to 10 percent
Taxonomic class: Fine, mixed, semiactive, thermic Aquic Hapludults

Typical Pedon

Helena sandy loam, 2 to 6 percent slopes; 1.4 miles south of Huntsboro on Secondary Road 1521, about 150 feet west on Secondary Road 1521, in a pasture; Oxford USGS topographic quadrangle; lat. 36 degrees 20 minutes 44 seconds N. and long. 78 degrees 20 minutes 44 seconds W.

Ap—0 to 9 inches; grayish brown (10YR 5/2) sandy loam; weak medium granular structure; friable; many fine and common medium roots; slightly acid; abrupt smooth boundary.

E—9 to 12 inches; light yellowish brown (10YR 6/4) sandy loam; weak medium granular structure; friable; common fine and few medium roots; very strongly acid; gradual wavy boundary.

BE—12 to 19 inches; brownish yellow (10YR 6/6) sandy clay loam; weak medium granular structure; friable; few fine roots; few fine pores; common medium distinct strong brown (7.5YR 5/8) irregularly shaped masses of iron accumulation with clear boundaries throughout; very strongly acid; gradual wavy boundary.

Bt1—19 to 24 inches; yellowish brown (10YR 5/8) clay; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; few fine roots; few fine pores; few fine distinct pale brown (10YR 6/3) irregularly shaped masses of iron accumulation with clear boundaries throughout and gray (10YR 6/1) irregularly shaped iron depletions with clear boundaries throughout; few

faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

Bt2—24 to 40 inches; strong brown (7.5YR 5/8) clay; moderate medium subangular blocky structure; firm; moderately sticky, moderately plastic; common medium distinct gray (10YR 6/1) irregularly shaped iron depletions with clear boundaries throughout; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

BCg—40 to 50 inches; light gray (10YR 7/1) clay loam; weak medium subangular blocky structure; friable; slightly sticky, slightly plastic; many coarse prominent brownish yellow (10YR 6/6) and strong brown (7.5YR 5/8) irregularly shaped masses of iron accumulation with clear boundaries throughout; very strongly acid; gradual wavy boundary.

C1—50 to 60 inches; strong brown (7.5YR 5/8) sandy loam saprolite; massive; very friable; common medium distinct light gray (10YR 7/1) irregularly shaped iron depletions with clear boundaries throughout; very strongly acid; gradual wavy boundary.

C2—60 to 72 inches; strong brown (7.5YR 5/8) sandy loam saprolite; massive; very friable; many medium prominent light gray (10YR 7/1) irregularly shaped iron depletions with clear boundaries throughout and yellow (10YR 7/8) irregularly shaped masses of iron accumulation with clear boundaries throughout; strongly acid.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: None
Content and size of rock fragments: Less than 15 percent, by volume; mostly gravel
Reaction: Extremely acid to strongly acid throughout the profile, except where surface layers have been limed

Ap horizon:
- Color—hue of 10YR or 2.5Y, value of 3 to 6, and chroma of 1 to 4
- Texture—sandy loam

E horizon:
- Color—hue of 10YR to 5Y, value of 5 to 8, and chroma of 2 to 4
- Texture—loamy coarse sand, loamy sand, coarse sandy loam, sandy loam, fine sandy loam, or loam

BE horizon:
- Color—hue of 7.5YR to 5Y, value of 5 to 8, and chroma of 3 to 8
- Texture—sandy clay loam or clay loam

Bt horizon:
- Color—hue of 7.5YR to 5Y, value of 5 to 8, and chroma of 3 to 8
- Texture—clay loam, sandy clay, or clay
- Redoximorphic features—iron or clay depletions in shades of white, gray, or brown and masses of iron accumulation in shades of yellow, brown, or red

BCg horizon:
- Color—hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 1 or 2
- Texture—sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam
- Redoximorphic features—iron or clay depletions in shades of white, gray, or brown and masses of iron accumulation in shades of yellow, brown, or red

C horizon:
- Color—hue of 5YR to 5Y, value of 5 to 8, and chroma of 3 to 8
- Texture—variable; commonly sandy clay loam, loam, fine sandy loam, or sandy loam saprolite
- Redoximorphic features—iron or clay depletions in shades of white, gray, or brown and masses of iron accumulation in shades of yellow or brown

Herndon Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Residuum weathered from mixed felsic and mafic volcanic rocks
Landscape: Piedmont uplands
Landform: Ridges and hill slopes
Slope: 2 to 10 percent
Taxonomic class: Fine, kaolinitic, thermic Typic Hapludults

Typical Pedon

Herndon silt loam, 2 to 6 percent slopes; 3 miles northwest of Oxford on U.S. Highway 96, about 200 feet northeast of the intersection of Secondary Roads 1300 and 1452, in a field; Berea USGS topographic quadrangle; lat. 36 degrees 23 minutes 03 seconds N. and long. 78 degrees 37 minutes 58 seconds W.

Ap—0 to 8 inches; brownish yellow (10YR 6/4) silt

loam; weak medium granular structure; very friable; strongly acid; clear smooth boundary.
Bt1—8 to 22 inches; brownish yellow (10YR 6/8) clay loam; few fine prominent red (2.5YR 4/8) mottles; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.
Bt2—22 to 34 inches; brownish yellow (10YR 6/7) clay loam; common fine prominent red (2.5YR 4/8) and few fine distinct very pale brown (10YR 8/4) mottles; weak medium subangular blocky structure; friable; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.
BC—34 to 40 inches; brownish yellow (10YR 6/8) silty clay loam; common fine prominent red (2.5YR 4/8) and common medium distinct very pale brown (10YR 8/4) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.
C1—40 to 53 inches; mottled brownish yellow (10YR 6/8), red (2.5YR 4/8), and very pale brown (10YR 8/4) silt loam saprolite; massive; very friable; very strongly acid; gradual wavy boundary.
C2—53 to 65 inches; multicolored silt loam saprolite in shades of red, yellow, and white; massive; very friable; very strongly acid.

Range in Characteristics

Thickness of the solum: 40 to 60 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: None
Content and size of rock fragments: Less than 50 percent, by volume, in the A horizon and less than 10 percent in the B and C horizons; mostly gravel
Reaction: Very strongly acid to slightly acid in the A horizon, except where limed, and extremely acid to strongly acid in the B and C horizons

Ap or A horizon:
Color—hue of 7.5YR to 5Y, value of 3 to 6, and chroma of 2 to 8
Texture—silt loam

Bt horizon:
Color—hue of 5YR to 10YR, value of 4 to 7, and chroma of 4 to 8
Mottles—shades of red, brown, or yellow
Texture (upper part)—clay loam, silty clay, or clay
Texture (lower part)—clay loam, silty clay, clay, or silty clay loam

BC horizon:
Color—hue of 5YR to 10YR, value of 4 to 7, and chroma of 4 to 8
Mottles—shades of red, brown, or yellow
Texture—loam, silt loam, silty clay loam, or clay loam

C horizon:
Color—mottled or multicolored in shades of red, brown, yellow, or white
Texture—fine sandy loam, loam, or silt loam saprolite

Iredell Series

Depth class: Deep
Drainage class: Moderately well drained
Permeability: Slow
Parent material: Residuum weathered from mafic intrusive rocks
Landscape: Piedmont uplands
Landform: Ridges and broad interstream divides
Slope: 2 to 6 percent
Taxonomic class: Fine, smectitic, thermic Typic Hapludalfs

Typical Pedon

Iredell loam, 2 to 6 percent slopes; 0.5 mile north of the intersection of Secondary Roads 1103 and 1120, about 800 feet east of Secondary Road 1103, in an area of woodland; Lake Mitchie USGS topographic quadrangle; lat. 36 degrees 08 minutes 42 seconds N. and long. 78 degrees 46 minutes 25 seconds W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loam; weak medium granular structure; friable; slightly sticky, slightly plastic; many fine and medium roots; few fine and medium black concretions; slightly acid; abrupt smooth boundary.
BA—6 to 10 inches; brown (10YR 4/3) loam; weak medium granular structure; friable; slightly sticky, slightly plastic; many fine roots; few fine and medium black concretions; slightly acid; abrupt smooth boundary.
Bt—10 to 24 inches; dark brown (10YR 4/3) clay; moderate medium subangular blocky structure; very firm; very sticky, very plastic; few distinct clay films on faces of peds; common fine black concretions; slightly acid; gradual wavy boundary.
BC—24 to 28 inches; dark brown (10YR 4/3) clay loam; weak medium subangular blocky structure; very firm; moderately sticky, moderately plastic; few fine black concretions; common medium distinct light brownish gray (10YR 6/2) irregularly shaped iron depletions with clear boundaries in the matrix and common fine prominent strong brown (7.5YR 5/6) irregularly shaped masses of iron accumulation with clear boundaries throughout; neutral; gradual smooth boundary.

C—28 to 53 inches; 50 percent brownish yellow (10YR 6/6), 35 percent light brownish gray (10YR 6/2), and 15 percent black (10YR 2/1) loam saprolite; iron depletions occurring as areas in shades of gray and masses of iron accumulation occurring as areas in shades of yellow or black; neutral; gradual irregular boundary.
Cr—53 to 65 inches; weathered multicolored fractured diabase that can be dug by a spade with difficulty.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to bedrock: 40 to 60 inches to soft bedrock and more than 60 inches to hard bedrock
Content of mica flakes: None to many in the B and C horizons
Content and size of rock fragments: Less than 15 percent, by volume, in the A and B horizons and less than 10 percent in the C horizon; mostly gravel
Reaction: Strongly acid to neutral in the A horizon, moderately acid to slightly alkaline in the B horizon, and neutral or slightly alkaline in the C horizon

Ap horizon:
Color—hue of 10YR to 5Y, value of 4 or 5, and chroma of 2 to 4
Texture—loam

BA horizon:
Color—hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 to 4
Texture—loam, clay loam, or silt loam

Bt horizon:
Color—hue of 10YR to 5Y, value of 4 to 6, and chroma of 3 to 6
Texture—clay loam or clay

BC horizon:
Color—hue of 10YR to 5Y, value of 4 to 7, and chroma of 3 to 6
Mottles—shades of red, brown, yellow, olive, or gray
Texture—sandy clay loam, clay loam, or clay
Redoximorphic features—iron or clay depletions in shades of white, olive gray, or brown and masses of iron accumulation in shades of yellow, brown, red, or black

C horizon:
Color—mottled or multicolored in shades of brown, yellow, black, white, olive, or gray
Texture—sandy loam, loam, or sandy clay loam saprolite
Redoximorphic features—iron or clay depletions in shades of white, olive gray, or brown and masses of iron accumulation in shades of yellow, brown, or red

Cr layer:
Type of bedrock—weathered multicolored mafic intrusive rock that can be dug by hand tools with difficulty

Lignum Series

Depth class: Deep
Drainage class: Moderately well drained or somewhat poorly drained
Permeability: Very slow
Parent material: Residuum weathered from felsic volcanic rocks
Landscape: Piedmont uplands
Landform: Broad interstream divides, slight depressions, and heads of drainageways
Slope: 2 to 6 percent
Taxonomic class: Fine, mixed, semiactive, thermic Aquic Hapludults

Typical Pedon

Lignum silt loam, 2 to 6 percent slopes; 3.0 miles northwest of Oxford on U.S. Highway 98, about 1.2 miles north of Kinton on Secondary Road 1300, about 100 feet west of Secondary Road 1300, in a field; Berea USGS topographic quadrangle; lat. 36 degrees 21 minutes 44 seconds N. and long. 78 degrees 37 minutes 52 seconds W.

Ap—0 to 10 inches; light yellowish brown (10YR 6/4) silt loam; weak medium granular structure; friable; slightly sticky, slightly plastic; strongly acid; abrupt smooth boundary.
BE—10 to 14 inches; light yellowish brown (10YR 6/4) silt loam; weak medium granular structure; friable; slightly sticky, slightly plastic; strongly acid; gradual wavy boundary.
Bt1—14 to 20 inches; light yellowish brown (10YR 6/4) silty clay loam; moderate fine subangular blocky structure; friable; moderately sticky, moderately plastic; common fine distinct strong brown (7.5YR 5/8) irregularly shaped masses of iron accumulation with clear boundaries throughout and gray (10YR 7/2) irregularly shaped iron depletions with sharp boundaries in the matrix; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.
Bt2—20 to 34 inches; brownish yellow (10YR 6/6) silty clay loam; moderate medium subangular blocky structure; firm; moderately sticky, moderately plastic; common medium distinct yellowish brown

(10YR 5/8) irregularly shaped masses of iron accumulation with clear boundaries throughout and gray (10YR 7/2) irregularly shaped iron depletions with sharp boundaries in the matrix; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

BC—34 to 39 inches; brownish yellow (10YR 6/6) silt loam; weak fine subangular blocky structure; friable; common medium distinct light gray (10YR 7/2) irregularly shaped iron depletions with clear boundaries throughout and strong brown (7.5YR 5/8) irregularly shaped masses of iron accumulation with clear boundaries throughout; strongly acid; gradual wavy boundary.

C—39 to 46 inches; multicolored silt loam saprolite in shades of brown, yellow, or gray; massive; firm; 10 percent gravel, by volume; iron depletions occurring as areas in shades of gray and masses of iron accumulation occurring as areas in shades of brown and yellow; strongly acid; abrupt smooth boundary.

Cr—46 to 62 inches; weathered multicolored fractured schist that can be dug by a spade with difficulty.

Range in Characteristics

Thickness of the solum: 20 to 40 inches

Depth to bedrock: 40 to 60 inches to soft bedrock and more than 60 inches to hard bedrock

Content of mica flakes: None

Content and size of rock fragments: Less than 15 percent, by volume, in the A and B horizons and 10 to 50 percent in the BC and C horizons; mostly gravel

Reaction: Very strongly acid or strongly acid throughout the profile, except where surface layers have been limed

A or Ap horizon:
- Color—hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 1 to 4
- Texture—silt loam

BE horizon:
- Color—hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 3 to 8
- Texture—loam, silt loam, clay loam, or silty clay loam

Bt horizon:
- Color—hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 1 to 8
- Texture—clay loam, silty clay loam, silty clay, or clay
- Redoximorphic features—iron or clay depletions in shades of white, gray, or brown and masses of iron accumulation in shades of yellow or brown

BC horizon:
- Color—hue of 7.5YR to 5Y, value of 5 to 7, and chroma of 1 to 8
- Texture (fine-earth fraction)—loam, silt loam, clay loam, or silty clay loam
- Redoximorphic features—iron or clay depletions in shades of white, gray, or brown and masses of iron accumulation in shades of yellow or brown

C horizon:
- Color—variable; commonly multicolored in shades of brown, yellow, or gray
- Texture (fine-earth fraction)—silt, silt loam, sandy clay loam, or silty clay loam saprolite
- Redoximorphic features—iron or clay depletions in shades of white, gray, or brown and masses of iron accumulation in shades of yellow or brown

Cr layer:
- Type of bedrock—weathered multicolored fractured felsic volcanic rock that can be dug by hand tools with difficulty

R layer (if it occurs):
- Type of bedrock—unweathered fractured felsic volcanic rock

Nason Series

Depth class: Deep

Drainage class: Well drained

Permeability: Moderate

Parent material: Residuum weathered from felsic volcanic rocks

Landscape: Piedmont uplands

Landform: Narrow ridgetops and hill slopes

Slope: 2 to 50 percent

Taxonomic class: Fine, kaolinitic, thermic Typic Hapludults

Typical Pedon

Nason gravelly loam, 2 to 6 percent slopes; 0.7 mile west of Culbreth on Secondary Road 1139, about 1.5 miles west on Secondary Road 1126, about 2.0 miles west on a farm road, 75 feet west of the farm road on Bowling's Mountain, in an area of woodland; Roxboro USGS topographic quadrangle; lat. 36 degrees 16 minutes 24 seconds N. and long. 78 degrees 46 minutes 01 second W.

A—0 to 7 inches; grayish brown (10YR 4/2) gravelly loam; moderate fine granular structure; nonsticky, nonplastic; common fine, many medium, and few coarse roots; 20 percent gravel, by volume; very strongly acid; clear smooth boundary.

E—7 to 12 inches; yellowish brown (10YR 5/4) loam;

weak fine subangular blocky structure; friable; slightly sticky, nonplastic; common fine and medium roots; 10 percent gravel, by volume; very strongly acid; clear wavy boundary.

Bt1—12 to 24 inches; strong brown (7.5YR 5/6) clay loam; moderate fine subangular blocky structure; firm; moderately sticky, moderately plastic; few medium roots; 5 percent gravel, by volume; very strongly acid; gradual wavy boundary.

Bt2—24 to 32 inches; yellowish red (5YR 5/6) clay; moderate fine subangular blocky structure; firm; moderately sticky, moderately plastic; few medium roots; 5 percent gravel, by volume; very strongly acid; gradual wavy boundary.

BC—32 to 37 inches; strong brown (10YR 5/8) gravelly silty clay loam; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; few fine roots; 15 percent gravel, by volume; very strongly acid; gradual wavy boundary.

C—37 to 42 inches; multicolored gravelly silt loam saprolite in shades of red, brown, and white; massive; very friable; 15 percent gravel, by volume; very strongly acid; gradual irregular boundary.

Cr—42 to 60 inches; weathered multicolored fractured schist that can be dug by a spade with difficulty.

Range in Characteristics

Thickness of the solum: 20 to 50 inches

Depth to bedrock: 40 to 60 inches to soft bedrock and more than 60 inches to hard bedrock

Content of mica flakes: None

Content and size of rock fragments: 15 to 35 percent, by volume, in the A horizon, 5 to 20 percent in the E and Bt horizons, and 15 to 40 percent in the BC and C horizons; mostly gravel (fig. 14)

Reaction: Very strongly acid or strongly acid throughout the profile, except where surface layers have been limed

A horizon:
- Color—hue of 7.5YR or 10YR, value of 2 to 5, and chroma of 2 to 4
- Texture (fine-earth fraction)—loam

E horizon:
- Color—hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 2 to 6
- Texture (fine-earth fraction)—fine sandy loam, loam, or silt loam

Bt horizon:
- Color—hue of 5YR to 10YR, value of 4 to 6, and chroma of 4 to 8
- Texture (fine-earth fraction)—clay loam, silty clay loam, silty clay, or clay

BC horizon:
- Color—hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8
- Texture (fine-earth fraction)—loam, silt loam, clay loam, or silty clay loam

C horizon:
- Color—multicolored in shades of red, brown, yellow, or white
- Texture—silt loam or silty clay loam saprolite

Cr layer:
- Type of bedrock—weathered fractured felsic volcanic rock that can be dug by hand tools with difficulty

Figure 14.—A profile of Nason soils. These soils occur in the western part of the camp. They commonly have gravel in the surface layer and stones on the surface. Areas with stones on the surface are identified on the soil map by a special symbol. The main limitation of these soils is the depth to soft bedrock. Bedrock occurs below a depth of 40 inches.

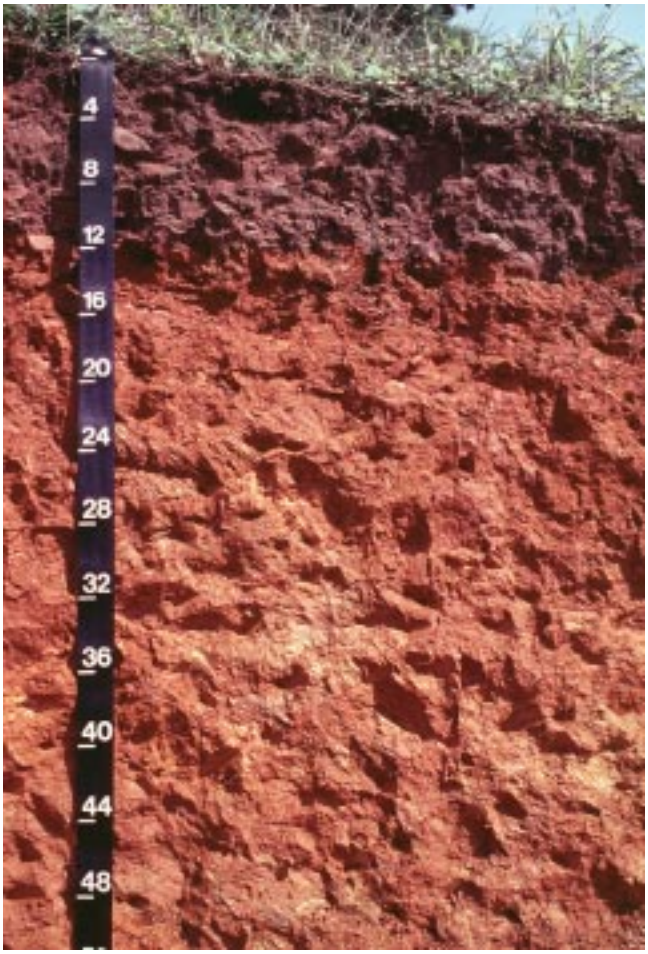

Figure 15.—A profile of Pacolet soils. These soils occur on sloping landscapes in the survey area, mainly in the southeastern part of the camp. They have a thin subsoil of clay but have few limitations for use and management.

Pacolet Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Residuum weathered from felsic intrusive rocks
Landscape: Piedmont uplands (fig. 15)
Landform: Narrow hill slopes
Slope: 10 to 50 percent
Taxonomic class: Fine, kaolinitic, thermic Typic Kanhapludults

Typical Pedon

Pacolet sandy loam, 10 to 25 percent slopes; 1,200 feet east of a barn on the road on Oxford Masonic Orphanage Farm, in a pasture near a fence; Oxford USGS topographic quadrangle; lat. 36 degrees 19 minutes 20 seconds N. and long. 78 degrees 35 minutes 20 seconds W.

Ap—0 to 8 inches; reddish brown (5YR 4/4) sandy loam; moderate medium subangular blocky structure; friable; very strongly acid; clear smooth boundary.
Bt—8 to 25 inches; red (2.5YR 4/6) clay; weak medium subangular blocky structure; firm; moderately sticky, moderately plastic; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.
BC—25 to 40 inches; red (2.5YR 4/8) clay loam; weak medium subangular blocky structure; firm; slightly sticky, slightly plastic; common fine flakes of mica; very strongly acid; gradual wavy boundary.
C—40 to 65 inches; red (2.5YR 4/8) loam saprolite; massive; very friable; slightly sticky, slightly plastic; common fine black concretions; common fine flakes of mica; very strongly acid.

Range in Characteristics

Thickness of the solum: 20 to 45 inches
Depth to bedrock: More than 60 inches
Content of mica flakes: None to common in the A and B horizons and few to many in the C horizon
Content and size of rock fragments: Less than 15 percent, by volume; mostly gravel
Reaction: Very strongly acid to slightly acid in the A horizon, except where limed, and very strongly acid to moderately acid in the B and C horizons

A or Ap horizon:
Color—hue of 5YR to 10YR, value of 3 to 5, and chroma of 1 to 4
Texture—loam

Bt horizon:
Color—hue of 10R or 2.5YR, value of 4 or 5, and chroma of 6 to 8
Mottles (if they occur)—shades of brown or yellow
Texture—clay loam, sandy clay, or clay

BC horizon:
Color—hue of 10R to 5YR, value of 4 or 5, and chroma of 6 to 8
Mottles (if they occur)—shades of brown or yellow
Texture—sandy loam, loam, sandy clay loam, or clay loam

C horizon:
Color—horizon is multicolored in shades of red, brown, or yellow or has hue of 10R to 5YR, value of 4 or 5, and chroma of 6 to 8
Mottles (if they occur)—shades of brown or yellow
Texture—sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam saprolite

Rion Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Residuum weathered from felsic intrusive rocks
Landscape: Piedmont uplands
Landform: Narrow hill slopes
Slope: 15 to 30 percent
Taxonomic class: Fine-loamy, mixed, semiactive, thermic Typic Hapludults

Typical Pedon

Rion sandy loam in an area of Wateree-Rion-Wedowee complex, 15 to 30 percent slopes; 8 miles northeast of Wilton on Secondary Road 1627, about 1,000 feet east on Secondary Road 1627, about 300 feet south of Secondary Road 1627, in an area of woodland; Wilton USGS topographic quadrangle; lat. 36 degrees 09 minutes 26 seconds N. and long. 78 degrees 31 minutes 08 seconds W.

Oe—1 inch to 0; partially decomposed hardwood leaf litter.
A1—0 to 5 inches; very dark grayish brown (10YR 3/2) sandy loam; moderate fine granular structure; very friable; few medium and common fine roots; moderately acid; abrupt smooth boundary.
A2—5 to 8 inches; brown (10YR 4/3) sandy loam; moderate fine granular structure; very friable; common very fine and fine and few medium and coarse roots; moderately acid; clear smooth boundary.
E—8 to 16 inches; brownish yellow (10YR 6/6) sandy loam; moderate fine granular structure; very friable; common very fine and fine and few coarse roots; strongly acid; clear smooth boundary.
Bt—16 to 26 inches; yellowish brown (10YR 5/6) clay loam; very coarse subangular blocky structure; firm; slightly sticky, slightly plastic; common fine roots; few faint dark yellowish brown (10YR 4/6) clay films on faces of peds; few fine flakes of mica; very strongly acid; gradual wavy boundary.
BC—26 to 34 inches; yellowish brown (10YR 5/6) sandy clay loam; common fine black, white, and yellow streaks; weak coarse subangular blocky structure; very friable; slightly sticky, slightly plastic; strongly acid; gradual wavy boundary.
C—34 to 65 inches; multicolored sandy clay loam saprolite in shades of brown, yellow, and white; massive; very friable; very strongly acid.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to bedrock: More than 60 inches
Reaction: Very strongly acid to slightly acid throughout the profile, except where surface layers have been limed
Content of mica flakes: None to common
Content and size of rock fragments: Less than 15 percent, by volume; mostly gravel

A horizon:
Color—hue of 5YR to 2.5Y, value of 3 to 6, and chroma of 2 to 6
Texture—loam

E horizon:
Color—hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 3 to 6
Texture—loamy sand, sandy loam, fine sandy loam, or loam

Bt horizon:
Color—hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8
Texture—sandy loam, fine sandy loam, sandy clay loam, or clay loam

BC horizon:
Color—hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8
Mottles—shades of red, brown, yellow, gray, or white
Texture—sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam

C horizon:
Color—horizon has hue of 2.5YR to 10YR, value of 4 to 6, and chroma of 4 to 8 or is multicolored in shades of red, brown, yellow, or white
Texture (fine-earth fraction)—loamy sand, coarse sandy loam, sandy loam, fine sandy loam, or sandy clay loam saprolite

Cr layer (if it occurs):
Type of bedrock—weathered multicolored felsic intrusive rock that can be dug by hand tools with difficulty

Tatum Series

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Residuum weathered from mixed felsic and mafic volcanic rocks
Landscape: Piedmont uplands
Landform: Hill slopes
Slope: 10 to 25 percent

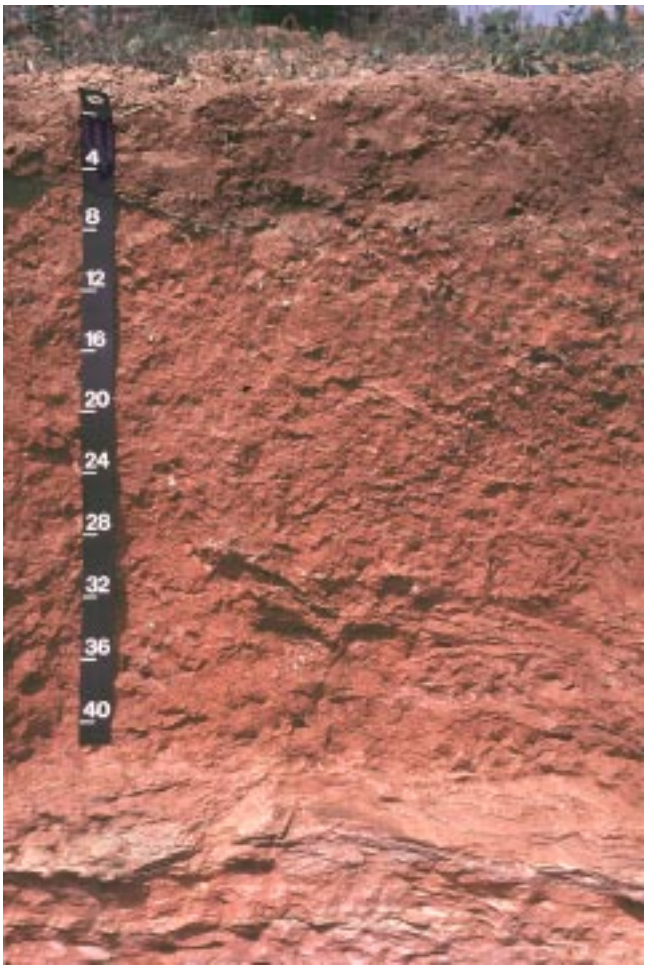

Figure 16.—A profile of Tatum soils. These soils have limitations for some uses due to the depth to soft bedrock. In the photograph, note the bedrock just below a depth of 40 inches.

Taxonomic class: Fine, kaolinitic, thermic Typic Hapludults

Typical Pedon

Tatum loam, 10 to 25 percent slopes; 1.5 miles east of Jonathan Crossroads on Secondary Road 1400, about 0.6 mile north on a farm road, 75 feet southwest of the farm road, in an area of second-growth woodland; Nelson USGS topographic quadrangle; lat. 36 degrees 31 minutes 19 seconds N. and long. 78 degrees 39 minutes 18 seconds W.

Ap—0 to 5 inches; strong brown (7.5YR 5/6) loam; moderate medium granular structure; very friable; very strongly acid; clear smooth boundary.

Bt—5 to 31 inches; red (2.5YR 5/8) clay; moderate medium subangular blocky structure; firm; moderately sticky, slightly plastic; few faint clay films on faces of peds; very strongly acid; clear wavy boundary.

BC—31 to 40 inches; red (2.5YR 5/8) silty clay loam; weak medium subangular blocky structure; very friable; slightly sticky, slightly plastic; very strongly acid; gradual wavy boundary.

C—40 to 58 inches; yellowish red (5YR 5/8) silty clay loam saprolite; massive; very friable; slightly sticky, slightly plastic; very strongly acid; gradual wavy boundary.

Cr—58 to 70 inches; weathered multicolored fractured schist that can be dug by a spade with difficulty.

Range in Characteristics

Thickness of the solum: 30 to 60 inches

Depth to bedrock: 40 to 60 inches to soft bedrock and more than 60 inches to hard bedrock (fig. 16)

Content of mica flakes: None to common

Content and size of rock fragments: Less than 15 percent, by volume; mostly gravel

Reaction: Very strongly acid or strongly acid throughout the profile, except where surface layers have been limed

Ap or A horizon:
- Color—hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 2 to 8
- Texture—loam

E horizon (if it occurs):
- Color—hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 3 to 6
- Texture—silt loam or fine sandy loam

Bt horizon:
- Color—hue of 10R or 2.5YR, value of 4 or 5, and chroma of 6 to 8
- Mottles—shades of red, brown, or yellow
- Texture—clay loam, silty clay loam, silty clay, or clay

BC horizon:
- Color—hue of 10R to 5YR, value of 4 to 6, and chroma of 4 to 8
- Mottles—shades of red, brown, or yellow
- Texture—silty clay loam, silty clay, clay loam, or clay

C horizon:
- Color—hue of 10R to 5YR, value of 4 to 6, and chroma of 4 to 8
- Texture—loam, silt loam, clay loam, silty clay loam, silty clay, or clay saprolite

Cr layer:
Type of bedrock—weathered fractured felsic volcanic rock that can be dug by hand tools with difficulty

Udorthents

Depth class: Deep or very deep
Drainage class: Well drained or moderately well drained
Permeability: Moderate to slow
Parent material: Fill areas—mixtures of natural soil material; excavated areas—variable, depending on the type of underlying bedrock
Landscape: Mostly uplands and terraces where natural soil material has been excavated or covered by earthy fill material
Landform: Variable; commonly in depressional areas or on broad flats in urban areas
Slope: 0 to 10 percent

Range in Characteristics

Thickness of the underlying material: 30 to more than 60 inches
Bedrock: Excavated areas—commonly exposed at the soil surface; fill areas—at a depth of 40 to more than 60 inches
Content of rock fragments: Variable; commonly 15 to 50 percent
Size of rock fragments: Ranging from gravel to stones
Reaction: Extremely acid to moderately acid throughout the profile, except where surface layers have been limed

Fill areas:
Color—hue of 2.5YR to 10YR, value of 4 to 7, and chroma of 2 to 8
Texture (fine-earth fraction)—variable; commonly loamy

Excavated areas:
Color—hue of 2.5YR to 5Y, value of 4 to 7, and chroma of 2 to 8
Texture (fine-earth fraction)—variable; commonly loamy

Vance Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Parent material: Residuum weathered from felsic intrusive rocks
Landscape: Piedmont uplands

Figure 17.—A profile of Vance soils. These soils are limited by a clayey subsoil which has mixed mineralogy and by a moderate shrink-swell potential.

Landform: Ridges, convex knolls, and hill slopes
Slope: 2 to 10 percent
Taxonomic class: Fine, mixed, semiactive, thermic Typic Hapludults (fig. 17)

Typical Pedon

Vance sandy loam, 2 to 6 percent slopes; 4 miles northeast of Oxford on Secondary Road 1522, about 1,000 feet north of Secondary Road 1521, about 50 feet northwest of the Big Zion Church, in a field; Oxford USGS topographic quadrangle; lat. 36 degrees 21 minutes 12 seconds N. and long. 78 degrees 32 minutes 38 seconds W.

Ap—0 to 9 inches; yellowish brown (10YR 5/4) sandy loam; weak medium granular structure; friable; moderately acid; abrupt smooth boundary.
Bt1—9 to 25 inches; brownish yellow (10YR 6/8) clay; few medium prominent red (2.5YR 5/8) mottles;

moderate medium subangular blocky structure; very firm; moderately sticky, moderately plastic; many distinct clay films on faces of peds; strongly acid; gradual wavy boundary.

Bt2—25 to 39 inches; brownish yellow (10YR 6/8) clay; common medium distinct red (2.5YR 5/8), yellow (10YR 8/8), and pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; very firm; slightly sticky, moderately plastic; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

BC—39 to 60 inches; brownish yellow (10YR 6/8) clay loam; common medium distinct red (2.5YR 5/8), yellow (10YR 8/8), and white (10YR 8/1) mottles; weak medium subangular blocky structure; firm; slightly sticky, moderately plastic; common lenses of sandy clay loam and clay; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

C—60 to 80 inches; multicolored sandy clay loam saprolite in shades of red, brown, yellow, and white; massive; friable; slightly sticky, slightly plastic; very strongly acid.

Range in Characteristics

Thickness of the solum: 24 to 40 inches

Depth to bedrock: More than 60 inches; commonly more than 72 inches

Content of mica flakes: None

Content and size of rock fragments: Less than 15 percent, by volume, in the A and E horizons and less than 10 percent in the B horizon; mostly gravel

Reaction: Very strongly acid to moderately acid in the A horizon, except where limed, and very strongly acid or strongly acid in the B and C horizons

Ap horizon:

Color—hue of 10YR to 2.5Y, value of 3 to 6, and chroma of 2 to 6

Texture—sandy loam

Bt horizon:

Color—hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8

Mottles (upper part)—shades of red, brown, or yellow

Mottles (lower part)—shades of red, brown, yellow, or gray

Texture—clay loam, sandy clay, or clay

BC horizon:

Color—hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8

Mottles—shades of red, brown, yellow, gray, or white

Texture—loam, sandy clay loam, clay loam, sandy clay, or clay

C horizon:

Color—multicolored in shades of red, brown, yellow, or white

Texture—variable; commonly sandy loam, loam, sandy clay loam, or clay loam saprolite

Wateree Series

Depth class: Moderately deep

Drainage class: Well drained

Permeability: Moderately rapid

Parent material: Residuum weathered from felsic intrusive rocks

Landscape: Piedmont uplands

Landform: Hill slopes

Slope: 15 to 30 percent

Taxonomic class: Coarse-loamy, mixed, semiactive, thermic Typic Dystrudepts

Typical Pedon

Wateree sandy loam in an area of Wateree-Rion-Wedowee complex, 15 to 30 percent slopes; 0.25 mile northwest of the intersection of Secondary Roads 1627 and 1625, about 200 feet east of Secondary Road 1625, in an area of woodland; Wilton USGS topographic quadrangle; lat. 36 degrees 09 minutes 06 seconds N. and long. 78 degrees 31 minutes 05 seconds W.

A—0 to 4 inches; brown (10YR 5/3) sandy loam; weak fine granular structure; very friable; common fine and coarse and few medium roots; very strongly acid; gradual wavy boundary.

Bw—4 to 21 inches; yellowish brown (10YR 5/4) sandy loam; weak medium subangular blocky structure; very friable; common very fine and fine and few medium roots; very strongly acid; gradual wavy boundary.

C—21 to 37 inches; very pale brown (10YR 7/4) coarse sandy loam saprolite; massive; very friable; few fine roots; very strongly acid.

Cr—37 to 62 inches; weathered multicolored granite that can be dug by a spade with difficulty.

Range in Characteristics

Thickness of the solum: 14 to 30 inches

Depth to bedrock: 20 to 40 inches to soft bedrock and 40 to more than 60 inches to hard bedrock

Content of mica flakes: None to common

Content and size of rock fragments: Less than 20 percent, by volume, in the A and B horizons and

less than 35 percent in the C horizon; mostly gravel
Reaction: Very strongly acid to moderately acid in the A and B horizons, except where surface layers have been limed, and extremely acid to moderately acid in the C horizon

A horizon:
Color—hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4
Texture—sandy loam

Bw horizon:
Color—hue of 7.5YR or 10YR, value of 4 to 7, and chroma of 4 to 8
Texture—loamy sand, sandy loam, fine sandy loam, or sandy clay loam

C horizon:
Color—multicolored in shades of brown, yellow, white, or black
Texture—sand, fine sand, loamy sand, loamy fine sand, fine sandy loam, or sandy loam saprolite

Cr layer:
Type of bedrock—weathered multicolored felsic intrusive rock that can be dug by hand tools with difficulty

Wedowee Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Parent material: Residuum weathered from felsic intrusive rocks
Landscape: Piedmont uplands
Landform: Ridges and hill slopes
Slope: 6 to 30 percent
Taxonomic class: Fine, kaolinitic, thermic Typic Kanhapludults

Typical Pedon

Wedowee sandy loam, 6 to 10 percent slopes; 2.5 miles east of Wilton on North Carolina Highway 56, about 1.5 miles northeast on Secondary Road 1625, about 1,000 feet north of the intersection of Secondary Roads 1628 and 1625, about 1,000 feet west of Secondary Road 1625, in a field: Wilton USGS topographic quadrangle; lat. 36 degrees 08 minutes 33 seconds N. and long. 78 degrees 31 minutes 18 seconds W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) sandy loam; moderate fine granular structure; very friable; strongly acid; abrupt smooth boundary.

E—4 to 7 inches; brownish yellow (10YR 6/6) coarse sandy loam; weak medium subangular blocky structure; friable; very strongly acid; clear smooth boundary.

Bt—7 to 23 inches; strong brown (7.5YR 5/6) clay; few fine distinct brownish yellow (10YR 6/6) and red (2.5YR 4/6) mottles; moderate medium subangular blocky structure; firm; slightly sticky, slightly plastic; few faint clay films on faces of peds; very strongly acid; gradual wavy boundary.

BC—23 to 35 inches; strong brown (7.5YR 5/6) clay loam; many fine distinct red (2.5YR 4/6) and common fine distinct brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; friable; slightly sticky, nonplastic; very strongly acid; gradual wavy boundary.

C—35 to 65 inches; multicolored sandy clay loam saprolite in shades of brown, yellow, or white; massive; very friable; very strongly acid.

Range in Characteristics

Thickness of the solum: 20 to 40 inches
Depth to bedrock: More than 60 inches; commonly more than 72 inches
Content of mica flakes: None or few in the A horizon and the upper part of the B horizon; none to common in the lower part of the B horizon and in the C horizon
Content and size of rock fragments: Less than 15 percent, by volume; mostly gravel
Reaction: Extremely acid to strongly acid throughout the profile, except where surface layers have been limed

A or Ap horizon:
Color—hue of 7.5YR to 2.5Y, value of 3 to 6, and chroma of 2 to 8
Texture—sandy loam

E horizon:
Color—hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 3 to 8
Texture—loamy coarse sand, loamy sand, coarse sandy loam, sandy loam, fine sandy loam, or loam

BE horizon (if it occurs):
Color—hue of 5YR to 10YR, value of 4 to 7, and chroma of 3 to 8
Texture—coarse sandy loam, sandy loam, fine sandy loam, loam, sandy clay loam, or clay loam

Bt horizon:
Color—hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 6 to 8

Mottles—shades of red, brown, or yellow
Texture—sandy clay loam, clay loam, sandy clay, or clay

BC horizon:
Color—hue of 2.5YR to 10YR, value of 5 to 7, and chroma of 4 to 8
Mottles—shades of red, brown, or yellow
Texture—fine sandy loam, loam, sandy clay loam, or clay loam

C horizon:
Color—multicolored in shades of red, brown, yellow, or white
Texture—sandy loam, sandy clay loam, clay loam, or sandy clay saprolite

Wehadkee Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderate
Parent material: Alluvial sediments
Landscape: Piedmont drainageways
Landform: Flood plains
Slope: 0 to 2 percent
Taxonomic class: Fine-loamy, mixed, active, nonacid, thermic Fluvaquentic Endoaquepts

Typical Pedon

Wehadkee loam in an area of Chewacla and Wehadkee soils, 0 to 2 percent slopes, frequently flooded; 3.4 miles north of Oxford on U.S. Highway 15, about 1 mile east on Secondary Road 1518, about 100 feet south on Secondary Road 1518, in an area of woodland; Oxford USGS topographic quadrangle; lat. 36 degrees 21 minutes 50 seconds N. and long. 78 degrees 33 minutes 59 seconds W.

A1—0 to 3 inches; brown (10YR 5/3) loam; weak fine granular structure; very friable; strongly acid; gradual wavy boundary.
A2—3 to 7 inches; brown (10YR 5/3) loam; moderate fine granular structure; very friable; common fine distinct brown (7.5YR 3/4) irregularly shaped masses of iron accumulation with clear boundaries in the matrix; few fine flakes of mica; strongly acid; clear smooth boundary.
A3—7 to 11 inches; dark gray (N 4/0) loam; moderate fine granular structure; very friable; common fine distinct dark brown (7.5YR 3/4) and common fine distinct brown (10YR 5/3) irregularly shaped masses of iron accumulation with clear boundaries in the matrix; few fine flakes of mica; strongly acid; clear smooth boundary.
A4—11 to 14 inches; dark gray (2.5Y 4/1) silt loam; weak fine granular structure; very friable; common medium distinct dark brown (7.5YR 3/4) and brown (10YR 5/3) irregularly shaped masses of iron accumulation with clear boundaries in the matrix; few fine flakes of mica; strongly acid; clear smooth boundary.
Bg1—14 to 22 inches; dark gray (10YR 4/1) loam; weak coarse subangular blocky structure; friable; few medium distinct brown (7.5YR 3/4) irregularly shaped masses of iron accumulation with clear boundaries in the matrix; few fine flakes of mica; very strongly acid; gradual wavy boundary.
Bg2—22 to 42 inches; gray (5Y 4/1) sandy clay loam; weak coarse subangular blocky structure; friable; common fine prominent strong brown (7.5YR 5/8) irregularly shaped masses of iron accumulation with clear boundaries in the matrix; few fine flakes of mica; moderately acid; gradual wavy boundary.
Cg—42 to 72 inches; gray (5Y 5/1) stratified loamy sand, sand, and sandy loam; massive; friable; few fine prominent greenish gray (5BG 6/1) irregularly shaped iron depletions with clear boundaries in the matrix; few fine flakes of mica; neutral.

Range in Characteristics

Thickness of the solum: 20 to more than 60 inches
Depth to bedrock: More than 60 inches; commonly more than 120 inches
Content of mica flakes: Few to many
Content and size of rock fragments: Less than 15 percent, by volume; mostly gravel
Reaction: Very strongly acid to neutral

A or Ap horizon:
Color—horizon is neutral in hue or has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 0 to 4
Texture—loam
Redoximorphic features—masses of iron accumulation in shades of brown

Bg horizon:
Color—horizon is neutral in hue or has hue of 10YR to 5Y, value of 4 to 6, and chroma of 0 to 2
Texture—loam, silt loam, sandy clay loam, clay loam, or silty clay loam
Redoximorphic features—masses of iron accumulation in shades of yellow, brown, or red

Cg horizon:
Color—horizon is neutral in hue or has hue of 10YR to 5Y, value of 4 to 7, and chroma of 0 to 2

Texture—variable; commonly sandy loam or loam; stratified gravel, sand, loamy sand, sandy clay loam, or clay loam below a depth of 40 inches
Redoximorphic features—iron or clay depletions in shades of gray or brown and masses of iron accumulation in shades of yellow, brown, or red

Wilkes Series

Depth class: Shallow
Drainage class: Well drained
Permeability: Moderately slow
Parent material: Residuum weathered from mixed acidic and basic rocks
Landscape: Piedmont uplands
Landform: Steep side slopes
Slope: 10 to 25 percent
Taxonomic class: Loamy, mixed, active, thermic, shallow Typic Hapludalfs

Typical Pedon

Wilkes sandy loam, 10 to 25 percent slopes; 10.4 miles southeast of Durham on State Road 1901, about 100 feet north of the road, in a wooded area; Bayleaf USGS topographic quadrangle; lat. 35 degrees 57 minutes 17 seconds N. and long. 78 degrees 44 minutes 15 seconds W.

Oi—3 inches to 1 inch; undecomposed mixed hardwood and pine forest litter.
Oe—1 inch to 0; partly decomposed forest litter.
A—0 to 3 inches; grayish brown (2.5Y 5/2) sandy loam; moderate medium granular structure; very friable; common fine and medium roots; common fine and medium quartz pebbles; strongly acid; abrupt smooth boundary.
E—3 to 6 inches; light brownish gray (2.5Y 6/2) sandy loam; moderate medium and coarse granular structure; very friable; common fine and medium roots; common fine strong brown fragments of weathered rocks; common fine and medium quartz pebbles; strongly acid; abrupt smooth boundary.
Bt—6 to 10 inches; yellowish brown (10YR 5/6) clay; common fine prominent black and green and faint strong brown mottles (assumed to be partially weathered primary materials); weak coarse angular blocky structure; firm; sticky, plastic; few fine roots; few fine pores; common faint clay films on faces of peds; few medium pebbles; material from A horizon in old root channels; slightly acid; clear wavy boundary.
Bt/C—10 to 13 inches; yellowish brown (10YR 5/6) clay loam (Bt part); weak coarse subangular blocky structure (Bt part); firm; sticky, plastic; common faint clay films on faces of peds; common fine prominent black and few fine distinct gray bodies; common thin green bands of partially weathered primary materials (C part); platy structure (C part); common hard schist fragments; slightly acid; abrupt wavy boundary.
Cr—13 to 48 inches; weathered multicolored fractured diabase that can be dug with difficulty with a spade.
R—48 inches; hard diabase.

Range in Characteristics

Depth to bedrock: 10 to 20 inches to soft bedrock and 40 to more than 60 inches to hard bedrock
Content and size of rock fragments: 0 to 50 percent in the A horizon and 0 to 35 percent in the B horizon; pebbles, cobbles, and stones
Reaction: Strongly acid to slightly acid in the upper part of the profile and moderately acid to mildly alkaline in the lower part

A or Ap horizon:
Color—hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 2 to 6
Texture—sandy loam

E horizon:
Color—hue of 10YR to 2.5Y, value of 5 or 6, and chroma of 2 to 4
Texture—sandy loam, fine sandy loam, or loam

Bt horizon:
Color—hue of 5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 8
Mottles—shades of black, brown, gray, or white
Texture—loam, sandy clay loam, clay loam, or clay; most pedons have thin transitional horizons

C horizon (if it occurs):
Color—hue of 5YR to 2.5Y, value of 2 to 6, and chroma of 1 to 4
Texture—saprolite of intermediate or mafic crystalline rock having texture of loam, fine sandy loam, or sandy loam

Cr horizon:
Type of bedrock—weathered intermediate or mafic crystalline rock than can be dug with difficulty with a spade

R layer:
Type of bedrock—unweathered intermediate or mafic crystalline rock

Formation of the Soils

This section describes the factors of soil formation and relates them to the soils in the survey area. It also provides information about the general geology and soil parent materials in the area.

Factors of Soil Formation

The characteristics of a soil are determined by the combined influence of parent material, climate, relief, time, and plant and animal life. These five factors achieve their influence by a variety of processes. The processes of soil formation include additions of organic and mineral material to the soil as solids, liquids, and gasses; losses of these materials from the soil; translocation of materials in the soil; and transformation of mineral and organic substances in the soil *(3)*.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. It is a major factor in determining what kind of soil forms and can be correlated to geologic formations. Parent material is largely responsible for the differences in texture, mineralogy, and chemistry that make a soil unique.

Climate

Climatic factors, particularly precipitation and temperature, affect the physical, chemical, and biological relationships in the soil. They influence the rate at which rocks weather and organic matter decomposes. The amount of leaching in a soil is related to the amount of rainfall and the movement of water through the soil. The effects of climate also control the kinds of plants and animals living in and on the soil. Temperature influences the rate of growth of organisms and the speed of chemical and physical reactions in the soil.

Camp Butner is in an area which generally has a warm, humid climate. Because variations in climate throughout the area are small, climate probably has not caused major local differences between soils. The mild temperatures and the abundant rainfall during most years promote the rapid growth of plants and the rapid decomposition of organic matter, hasten chemical reactions, speed the leaching of soluble bases, and increase the translocation of the less soluble, fine-textured particles in the soil profile. Consequently, many of the soils in the survey area are acid throughout, strongly leached, and low in base saturation.

Relief

Relief influences free drainage, surface runoff, soil temperature, and the extent of geologic erosion. The relief around Camp Butner is largely the result of dissection by Knapp of Reeds Creek, Camp Creek, and their tributaries. The degree of dissection of the landscape affects soil formation by influencing the depth of the water table and the rate of geologic erosion. On convex ridges and hill slopes in well dissected areas, soils have a deep water table and a brightly colored B horizon. Examples are Appling, Cecil, Georgeville, Herndon, Vance, and Wedowee soils. In the slightly dissected areas, such as on broad interstream divides, at the head of drainageways, and on the lower hill slopes, soils commonly have a perched water table and a B horizon that has a gray matrix or gray mottles. Examples are Helena, Iredell, and Lignum soils. Soils on flood plains receive runoff from adjacent areas and have a water table at or near the surface. These soils commonly have a dark-colored A horizon and a gray B horizon that may have brightly colored mottles. Examples are Chewacla and Wehadkee soils.

Relief can also affect the depth of soil development. In areas where the slope is more than 15 percent, geologic erosion removes soil material almost as fast as it forms. As a result, most of the strongly sloping to steep soils have a thinner solum than the less sloping soils. Examples are Pacolet, Tatum, Nason, Rion, and Wateree soils.

Time

The length of time that soil material has been exposed to the soil-forming processes accounts for

some differences between soils. The formation of a well defined profile, however, depends on other factors. Less time is required for a profile to develop in a warm, humid area where the plant cover is dense, as around Camp Butner, than in a cold, dry area where the plant cover is sparse.

Soils vary considerably in age. The length of time that a soil has been developing is reflected in the profile. Old soils generally have better defined horizons than young soils. In Camp Butner, the effects of time as a soil-forming factor are more apparent in the older soils, such as Cecil and Appling, which are in the more stable landform positions on uplands. These soils have more distinct horizons than Chewacla and Wehadkee soils, which are on flood plains. Chewacla and Wehadkee soils have not been in place long enough to have developed distinct horizons. They are considered young because of their topographic position.

Plant and Animal Life

Plants and animals determine the kinds of organic matter and how the organic matter is incorporated into the soil. Organic matter is the primary nutrient and energy reservoir for many soils. Plants release organic and inorganic compounds that affect the chemical breakdown of minerals in the soil. They take up nutrients from the lower horizons and, when their foliage dies, deposit them on the surface. Plant roots improve soil structure and porosity and physically hold soil material in place. Plant foliage protects the soil surface and thus reduces the hazards of soil blowing and water erosion.

Animals and insects transfer soil particles from one horizon to another. Like plants, earthworms and microorganisms aid the chemical breakdown of minerals and improve soil structure and porosity.

General Geology of the Soils

The soils of Camp Butner formed from primarily the Carolina Slate Belt *(4)*. Near Camp Butner, this parent rock system has major rock types occurring as two northeast- and southwest-trending parallel bands. Felsic volcanic rocks make up the area running from southwest to northeast through the center of the camp. Metamorphosed felsic intrusive rocks make up the area on either side of this band. Separating soil types within the Carolina Slate Belt is difficult because of the local variation in type, composition, and distribution of the rocks within the three bands. Certain soil types, however, are prevalent within each area.

Nason, Lignum, and Tatum soils are the major soils in the central band, and Vance and Helena soils are the major soils in the northwestern and southeastern areas of the camp. Within the southeastern band are areas of granitic-rich rock. Vance and Helena soils, which commonly occur in these areas, have a solum that has a higher content of sand than that of Georgeville, Herndon, Nason, Tatum, and Lignum soils. Generally, Georgeville, Herndon, Nason, Tatum, and Lignum soils occur in areas of schistose rocks. They have a higher content of silt than Vance and Helena soils.

References

(1) American Association of State Highway and Transportation Officials. 1986. Standard specifications for highway materials and methods of sampling and testing. Ed. 14, 2 vols.

(2) American Society for Testing and Materials. 1993. Standard classification of soils for engineering purposes. ASTM Stand. D 2487.

(3) Buol, S.W., F.D. Hole, and R.J. McCracken. 1980. Soil genesis and classification. 3d ed.

(4) Conrad, S.G. 1985. Geologic map of North Carolina. N.C. Dep. of Conserv. and Dev., Div. of Min. Resour.

(5) Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildl. Serv. FWS/OBS-79/31.

(6) Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. U.S. Army Engin. Waterways Exp. Stn., Vicksburg, MS, Tech. Rep. Y-87-1.

(7) Federal Register. July 13, 1994. Changes in hydric soils of the United States.

(8) Federal Register. February 24, 1995. Hydric soils of the United States.

(9) Hurt, G.W., P.M. Whited, and R.F. Pringle, eds. 1996. Field indicators of hydric soils in the United States. U.S. Dep. of Agric., Nat. Resour. Conserv. Serv.

(10) National Research Council. 1995. Wetlands: Characteristics and boundaries.

(11) Tiner, R.W., Jr. 1985. Wetlands of Delaware. Coop. Publ., U.S. Fish and Wildl. Serv., Newton Corner, MA, and Delaware Dep. of Nat. Resour. and Environ. Control, Wetlands Sect., Dover, DE.

(12) United States Department of Agriculture. 1991. Forest statistics for North Carolina, 1990. Forest Serv., Southeast. Forest Exp. Stn. Resour. Bull. SE-120.

(13) United States Department of Agriculture, Natural Resources Conservation Service. 1997. Soil survey of Granville County, North Carolina.

(14) United States Department of Agriculture, Soil Conservation Service. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. U.S. Dep. Agric. Handb. 436.

(15) United States Department of Agriculture, Soil Conservation Service. 1976. Soil survey of Durham County, North Carolina.

(16) United States Department of Agriculture, Soil Conservation Service. 1993. Soil survey manual. Soil Survey Staff, U.S. Dep. Agric. Handb. 18.

(17) United States Department of Agriculture, Soil Conservation Service. 1994. Keys to soil taxonomy. 6th ed. Soil Surv. Staff, Soil Manage. Support Serv. Tech. Monogr. 19.

Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Access road. A road constructed to facilitate the use and management of the land. Access roads are designed for limited traffic and typically consist of a cut slope, a roadbed, and a fill outslope.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Atterberg limits. Atterberg limits are measured for soil materials passing the No. 40 sieve. They include the liquid limit (LL), which is the moisture content at which the soil passes from a plastic to a liquid state, and the plasticity index (PI), which is the water content corresponding to an arbitrary limit between the plastic and semisolid states of consistency of a soil.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Back slope. The geomorphic component that forms the steepest inclined surface and principal element of many hillsides. Back slopes in profile are commonly steep, are linear, and may or may not include cliff segments.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Basic rock. An igneous rock composed dominantly of dark minerals. The minerals of this rock are comparatively low in silica and rich in bases, such as amphiboles, pyroxenes, biotite, and olivine.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Borrow pit. An open excavation from which the soil and underlying material have been removed, generally for use in road construction. Borrow pits support few or no plants without major reclamation. Areas identified on the detailed soil map by a special symbol typically are less than 2 acres in size.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Bouldery spot. An area where 0.01 to 0.1 percent of the surface is covered by rock fragments larger than 24 inches in diameter. Areas identified on the detailed soil map by a special symbol typically are less than 2 acres in size.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Broad-based dips. Short sections of access road having a reverse grade that intercept storm water. The dips are spaced about 200 feet apart and are designed to divert water away from stream crossings or steep grades.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Buffer zone. The area that extends from the boundary of the soil survey to 500 feet outside the boundary. It appears on the soil map.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning. Soils having a low cation-exchange capacity hold few cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. Soils having a high cation-exchange capacity can retain cations. The ability to retain cations helps to prevent the pollution of ground water.

Channery soil material. Soil material that is, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clayey. A general textural term that includes sandy clay, silty clay, and clay. According to family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) containing 35 percent or more clay, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map

them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Dbh (diameter at breast height). The diameter of a tree at 4.5 feet above the ground level on the uphill side.

Delineation. The process of drawing or plotting features on a map with lines and symbols.

Denitrification. The biochemical reduction of nitrate or nitrite to gaseous nitrogen either as molecular nitrogen or as an oxide of nitrogen.

Depression (depressional area). A portion of land surrounded on all sides by higher land. These areas generally do not have outlets for drainage.

Depth class. Refers to the depth to a root-restricting layer. Unless otherwise stated, this layer is understood to be consolidated bedrock. The depth classes in this survey are:

Very shallow	less than 10 inches
Shallow	10 to 20 inches
Moderately deep	20 to 40 inches
Deep	40 to 60 inches
Very deep	more than 60 inches

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diabase. A rock of basaltic composition consisting primarily of labradorite and pyroxene and characterized by ophitic texture.

Dike. A long, narrow cross-cutting mass of igneous rock that extends to or crops out on the land surface.

Diorite. A coarse-grained igneous rock with the composition of andesite (no quartz or orthoclase). It is composed of about 75 percent plagioclase feldspars with the balance being ferromagnesian silicates.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Engineering index test data. Laboratory test and mechanical analysis of selected soils in the survey area.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion classes. Classes based on estimates of past erosion. The classes are as follows:

Class 1.—Soils that have lost some of the original A horizon but on the average less than 25 percent of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick). Throughout most areas, the thickness of the surface layer is within the normal range of variability of the uneroded soil. Class 1 erosion typically is not designated in the name of the map unit or in the map symbol.

Class 2.—Soils that have lost an average of 25 to 75 percent of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick). Throughout most cultivated areas of class 2 erosion, the surface layer consists of a mixture of the original A horizon and material from below. Some areas may have intricate patterns ranging from uneroded spots to spots where all of the original A horizon has been removed.

Class 3.—Soils that have lost an average of 75 percent or more of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick). In most cultivated areas of class 3 erosion, material that was below the original A horizon is exposed. The plow layer consists entirely or largely of this material.

Class 4.—Soils that have lost all of the original A horizon or of the uppermost 8 inches (if the original A horizon was less than 8 inches thick) plus some or all of the deeper horizons throughout most of the area. The original soil can be identified only in spots. Some areas may be smooth, but most have an intricate pattern of gullies.

Erosion hazard. A term describing the potential for future erosion, inherent in the soil itself, in inadequately protected areas. The following definitions are based on estimated annual soil loss in metric tons per hectare (values determined by the Universal Soil Loss Equation assuming bare soil conditions and using rainfall and climate factors for North Carolina):

0 tons per hectare	none
Less than 2.5 tons per hectare	slight
2.5 to 10 tons per hectare	moderate
10 to 25 tons per hectare	severe
More than 25 tons per hectare	very severe

Evapotranspiration. The combined loss of water from a given area through surface evaporation and through transpiration by plants during a specified period.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Felsic rock. A general term for light-colored igneous rock and some metamorphic crystalline rock that have an abundance of quartz, feldspars, feldspathoids, and muscovite mica.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flooding. The temporary covering of the soil surface by flowing water from any source, such as

overflowing streams, runoff from adjacent or surrounding slopes, and inflow from high tides. The frequency of flooding generally is expressed as none, rare, occasional, or frequent. *None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year). *Frequent* means that flooding occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). The duration of flooding is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month).

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foot slope. The inclined surface at the base of a hill.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors which differentiate it from other stands.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Geomorphic surface. A part of the surface of the land that represents an episode of landscape development and consists of one or more landforms. It is a mappable part of the land surface that is defined in terms of morphology (relief, slope, aspect, etc.); origin (erosional, constructional, etc.); age (absolute or relative); and stability of component landforms.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Granite. A coarse-grained igneous rock dominated by light-colored minerals, consisting of about 50 percent orthoclase and 25 percent quartz with the balance being plagioclase feldspars and ferromagnesian silicates. Granites and granodiorites comprise 95 percent of all intrusive rocks.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot. An area of soils where the content of rock fragments generally less than 3 inches in diameter is more than 35 percent, by volume, in the surface layer. Areas identified on the detailed soil map by a special symbol typically are 1 to 3 acres in size.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A very small channel with steep sides cut by running water and through which water ordinarily runs only after rainfall, icemelt, or snowmelt. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage. Areas identified on the detailed soil map by a special symbol typically are less than 2 acres in size.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Head slope. A concave, horseshoe-shaped slope on a mountain landscape at the head of an intermittent drainageway.

High-grade metamorphic rocks. Highly metamorphosed rocks, such as gneiss and schist.

High water table (seasonal). The highest level of a saturated zone in the soil (the apparent or perched water table) over a continuous period of more than 2 weeks in most years, but not a permanent water table.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material.

Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intermediate rock. Igneous or metamorphic crystalline rock that is intermediate in composition between mafic and felsic rock.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Interstream divide (or interstream area). The nearly level land between drainageways in relatively undissected parts of the Coastal Plain. It is in areas on uplands, low marine terraces, and stream terraces. Soils in these areas are generally poorly drained or very poorly drained.

Iron depletions. Low-chroma zones that have a low content of iron and manganese oxide because of chemical reduction and removal but also have a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Kaolinite. An aluminosilicate clay mineral with a 1:1 layer structure; that is, a silicon tetrahedral sheet alternating with an aluminum octahedral sheet. Little or no expansion occurs when water mixes with the clay.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Landfill. An area of accumulated wastes produced by human activities. These areas can be above or below the natural ground level. Areas identified on the detailed soil map by a special symbol typically are less than 2 acres in size.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Linear extensibility. The change in length of an unconfined clod as moisture content is decreased from a moist to a dry state ($^1/_3$- or $^1/_{10}$-bar water content to oven dryness), expressed as a percent. The volume change is reported as percent change for the whole soil. Linear extensibility is used to determine shrink-swell potential classes for soils.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loamy. A general textural term that includes coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, clay loam, and sandy clay loam. According to family level criteria in the soil

taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) of loamy very fine sand or finer textured material that contains more than 15 percent fine sand or coarser sand and less than 35 percent clay, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

Low stream terrace. A terrace in an area that floods, commonly 3 to 10 feet higher in elevation than the adjacent flood plain.

Low strength. The soil is not strong enough to support loads.

Mafic rock. A dark rock composed predominantly of magnesium silicates. It can contain small amounts of quartz, feldspar, or muscovite mica.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mean annual increment. The average annual volume of a stand of trees from the year of origin to the age under consideration.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. nearly all such rocks are crystalline.

Metasedimentary rock. Metamorphosed sedimentary rocks, such as phyllite, metasandstone, and conglomerate.

Micas. A group of silicate minerals characterized by sheet or scale cleavage. Biotite is the ferromagnesian black mica. Muscovite is the potassic white mica.

Mine or quarry (map symbol). An open excavation from which the soil and underlying material have been removed, exposing bedrock; or the surface opening to underground mines. Areas identified on the detailed soil map by a special symbol typically are less than 2 acres in size.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Muscovite. A nonferromagnesian rock-forming silicate mineral that has tetrahedra arranged in sheets. Commonly called “white mica” and sometimes called potassic mica.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nose slope. The downward-sloping convex end of a main ridge or spur ridge.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Overstory. The portion of the trees in a forest stand forming the upper crown cover.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called “a soil.” A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from

about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Perennial stream. A stream, or reach of a stream, that flows continuously throughout the year.

Perennial water. An area that generally provides water for human or livestock consumption; commonly a lake, pond, river, or stream. Areas identified on the detailed soil map by a special symbol typically are less than 2 acres in size.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piedmont. The physiographic region of central North Carolina characterized by rolling landscapes formed from the weathering of residual rock material.

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pits. Open excavations from which soil and underlying material has been removed, exposing the bedrock. Areas identified on the detailed soil map by a special symbol typically are 0.5 acre to 1.5 acres in size.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse-grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Potential, soil. Relative terms are assigned to classes to indicate the potential of a soil for a particular use as compared with that of other soils in the area. The rating classes do not identify the most profitable soil use or imply a recommendation for a particular use. The following class terms and definitions are used nationwide:

Very high.—Production or performance is at or above local standards because soil conditions are exceptionally favorable, installation or management costs are low, and soil limitations are insufficient.

High.—Production or performance is at or above the level of locally established standards, the costs of measures for overcoming soil limitations are judged locally to be favorable in relation to the expected performance or yields, and soil limitations that continue after corrective measures are installed do not detract appreciably from environmental quality or economic returns.

Medium.—Production or performance is somewhat below locally established standards, the costs of measures for overcoming soil limitations are high, or soil limitations that continue after corrective measures are installed detract from environmental quality or economic returns.

Low.—Production or performance is significantly below local standards, measures that are required to overcome soil limitations are very costly, or soil limitations that continue after corrective measures are installed detract appreciably from environmental quality or economic returns.

Very low.—Production or performance is much below locally established standards, severe soil

limitations exist for which economically feasible measures are unavailable, or soil limitations that continue after corrective measures are installed seriously detract from environmental quality or economic returns.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate weather conditions and soil moisture conditions and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. They indicate chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. They indicate the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation. Descriptive terms for concentrations and depletions are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Reforestation. The process in which tree seedlings are planted or become naturally established in an area that was once forested.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Ridge. A long, narrow elevation of the land surface, usually having a sharp crest and steep sides.

Rippable. Rippable bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 drawbar horsepower rating.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rock outcrop. An area where bedrock is exposed at the surface of the earth. Areas identified on the detailed soil map by a special symbol typically are 0.5 acre to 2.0 acres in size.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Runoff class (surface). Refers to the rate at which water flows away from the soil over the surface without infiltrating. Six classes of rate of runoff are recognized:

Ponded.—Little of the precipitation and water that runs onto the soil escapes as runoff, and free water stands on the surface for significant periods. The amount of water that is removed from ponded areas by movement through the soil, by plants, or

by evaporation is usually greater than the total rainfall. Ponding normally occurs on level and nearly level soils in depressions. The water depth may fluctuate greatly.

Very slow.—Surface water flows away slowly, and free water stands on the surface for long periods or immediately enters the soil. Most of the water passes through the soil, is used by plants, or evaporates. The soils are commonly level or nearly level or are very porous.

Slow.—Surface water flows away so slowly that free water stands on the surface for moderate periods or enters the soil rapidly. Most of the water passes through the soil, is used by plants, or evaporates. The soils are nearly level or very gently sloping, or they are steeper but absorb precipitation very rapidly.

Medium.—Surface water flows away so rapidly that free water stands on the surface for only short periods. Part of the precipitation enters the soil and is used by plants, is lost by evaporation, or moves into underground channels. The soils are nearly level or gently sloping and absorb precipitation at a moderate rate, or they are steeper but absorb water rapidly.

Rapid.—Surface water flows away so rapidly that the period of concentration is brief and free water does not stand on the surface. Only a small part of the water enters the soil. The soils are mainly moderately steep or steep and have moderate or slow rates of absorption.

Very rapid.—Surface water flows away so rapidly that the period of concentration is very brief and free water does not stand on the surface. Only a small part of the water enters the soil. The soils are mainly steep or very steep and absorb precipitation slowly.

Sand. As a soil separate, individual rock or mineral fragments ranging from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sandy. A general textural term that includes coarse sand, sand, fine sand, very fine sand, loamy coarse sand, loamy sand, loamy fine sand, and loamy very fine sand. According to family level criteria in the soil taxonomic system, a specific textural name referring to fine earth (particles less than 2 millimeters in size) of sand or loamy sand that contains less than 50 percent very fine sand, by weight, within the control section. The content of rock fragments is less than 35 percent, by volume.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sesquioxides. A general term for oxides and hydroxides of iron and aluminum.

Severely eroded spot. An area of soil that has lost an average of 75 percent or more of the original surface layer because of accelerated erosion, occurring in a map unit in which the dominant soil or soils have lost less than 25 percent of the original surface layer. Areas identified on the detailed soil map by a special symbol typically are less than 2 acres in size.

Shoulder. The landscape position, parallel to the summit, that is directly below the ridgetop and directly above the side slope.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Short, steep slope (map symbol). A narrow area of soils that have slopes that are at least 2 slope classes steeper than the slope class of the surrounding map unit.

Shrink-swell potential. The potential for volume change in a soil with a loss or gain in moisture. Shrink-swell potential classes are based on the linear extensibility of the soil. If the soil has a linear extensibility of less than 3 percent, the shrink-

swell potential is low; 3 to 6 percent, the shrink-swell potential is moderate; 6 to 9 percent, the shrink-swell potential is high; and more than 9 percent, the shrink-swell potential is very high.

Side slope. The landscape position that is directly below the shoulder and directly above the toe slope. It makes up most of the mountainside or hillside.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Skidding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most systems involve pulling the trees with wire cables attached to a bulldozer or a rubber-tired tractor. Generally, felled trees are skidded or pulled with one end lifted to reduce friction and soil disturbance.

Skid trails. The paths left by skidding logs and the bulldozer or tractor used to pull them.

Slate. A fine-grained metamorphic rock with well developed slaty cleavage. Formed by the low-grade regional metamorphism of shale.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 6 percent
Moderately sloping	6 to 10 percent
Strongly sloping	10 to 15 percent
Moderately steep	15 to 25 percent
Steep	25 to 50 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Smectite. An aluminosilicate clay mineral with 2:1 layer structure; that is, two silicon tetrahedral sheets enclosing an aluminum octahedral sheet. Considerable expansion may occur when water mixes with the clay. Montmorillonite is a common mineral in the smectitic group.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil compaction. An alteration of soil structure that ultimately can affect the biological and chemical properties of the soil. Compaction decreases the extent of voids and increases bulk density.

Soil map unit. A kind of soil or miscellaneous area or a combination of two or more soils or one or more soils and one or more miscellaneous areas that can be shown at the scale of mapping for the defined purposes and objectives of the soil survey. Soil map units generally are designed to reflect significant differences in use and management among the soils of a survey area.

Soil sample site (map symbol). The location of a typifying pedon in the survey area.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and

sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Soil strength. The load-supporting capacity of a soil at specific moisture and density conditions.

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stand density. The degree to which an area is covered with living trees. It is usually expressed in units of basal areas per acre, number of trees per acre, or the percentage of ground covered by the tree canopy as viewed from above.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stony spot. An area where 0.01 to 3.0 percent of the surface is covered by rock fragments larger than 10 inches in diameter. Areas identified on the detailed soil map by a special symbol typically are 1 to 3 acres in size.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Suitability ratings. Ratings for the degree of suitability of soils for woodland and engineering uses. The ratings and the general criteria used for their selection are as follows:

Well suited.—The intended use may be initiated and maintained by using only the standard materials and methods typically required for that use. Good results can be expected.

Suited or moderately suited.—The limitations affecting the intended use make special planning, design, or maintenance necessary.

Poorly suited.—The intended use is difficult or costly to initiate and maintain because of certain soil properties, such as steep slopes, a severe hazard of erosion, a high water table, low fertility, and a hazard of flooding. Major soil reclamation, special design, or intensive management practices are needed.

Very poorly suited, not suited, or unsuited.—The intended use is very difficult or costly to initiate and maintain, and thus it generally should not be undertaken.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the “plow layer,” or the “Ap horizon.”

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying “coarse,” “fine,” or “very fine.” The textural classes are defined as follows:

Sands (coarse sand, sand, fine sand, and very fine sand).—Soil material in which the content of sand is 85 percent or more and the percentage of silt plus 1 1/2 times the percentage of clay does not exceed 15.

Loamy sands (loamy coarse sand, loamy sand, loamy fine sand, and loamy very fine sand).—Soil material in which, at the upper limit, the content of sand is 85 to 90 percent and the percentage of silt plus 1 1/2 times the percentage of clay is not less than 15; at the lower limit, the content of sand is 70 to 85 percent and the percentage of silt plus twice the percentage of clay does not exceed 30.

Sandy loams (coarse sandy loam, sandy loam, fine sandy loam, and very fine sandy loam).—Soil

material in which the content of clay is 20 percent or less, the percentage of silt plus twice the percentage of clay exceeds 30, and the content of sand is 52 percent or more or soil material in which the content of clay is less than 7 percent, the content of silt is less than 50 percent, and the content of sand is 43 to 52 percent.
Loam.—Soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand.
Silt loam.—Soil material that contains 50 percent or more silt and 12 to 27 percent clay or 50 to 80 percent silt and less than 12 percent clay.
Silt.—Soil material that contains 80 percent or more silt and less than 12 percent clay.
Sandy clay loam.—Soil material that contains 20 to 35 percent clay, less than 28 percent silt, and 45 percent or more sand.
Clay loam.—Soil material that contains 27 to 40 percent clay and 20 to 45 percent sand.
Silty clay loam.—Soil material that contains 27 to 40 percent clay and less than 20 percent sand.
Sandy clay.—Soil material that contains 35 percent or more clay and 45 percent or more sand.
Silty clay.—Soil material that contains 40 percent or more clay and 40 percent or more silt.
Clay.—Soil material that contains 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topography. The relative positions and elevations of the natural or manmade features of an area that describe the configuration of its surface.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Triassic. The earliest of the three geologic periods comprising the Mesozoic era; approximately 225 million years ago to 180 million years ago.

Underlying material. Technically the C horizon; the part of the soil below the biologically altered A and B horizons.

Understory. The trees and other woody species growing under a more or less continuous cover of branches and foliage formed collectively by the upper portions of adjacent trees and other woody growth.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Very bouldery spot. An area where more than 3 percent of the surface is covered by rock fragments larger than 10 inches in diameter. Areas identified on the detailed soil map by a special symbol typically are 1 to 3 acres in size.

Very stony spot. An area where 0.1 to 3.0 percent of the surface is covered by rock fragments larger than 10 inches in diameter. Areas identified on the detailed soil map by a special symbol typically are less than 2 acres in size.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and to divert water off and away from the road surface. Water bars can be easily driven over if they are constructed properly.

Water table (apparent). A thick zone of free water in the soil. The apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Water table (perched). A saturated zone of water in the soil standing above an unsaturated zone.

Water turnouts. Small, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and to divert water off and away from the road surface.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse-grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wetness. A general term applied to soils that hold water at or near the surface long enough to be a common management problem.

Wet spot. An area of somewhat poorly drained to very poorly drained soils that are at least two drainage classes wetter than the named soils in the surrounding map unit. Areas identified on the detailed soil map by a special symbol typically are 0.5 acre to 3.0 acres in size. (See Drainage class.)

Windthrow. The uprooting and tipping over of trees by the wind.

Yarding paths. The paths left by cable-yarded logs as they were pulled uphill or downhill to a nearby area.

Yield (forest land). The volume of wood fiber from trees harvested in a certain unit of area. Yield is usually measured in board feet or cubic feet per acre.

Tables

Table 1.—Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
ApB	Appling sandy loam, 2 to 6 percent slopes	187	3.8
ApC	Appling sandy loam, 6 to 10 percent slopes	139	2.8
CaB	Cecil sandy loam, 2 to 6 percent slopes	17	0.3
ChA	Chewacla and Wehadkee soils, 0 to 2 percent slopes, frequently flooded	275	5.6
GeB	Georgeville silt loam, 2 to 6 percent slopes	265	5.4
GeC	Georgeville silt loam, 6 to 10 percent slopes	177	3.6
HeB	Helena sandy loam, 2 to 6 percent slopes	1,141	23.3
HeC	Helena sandy loam, 6 to 10 percent slopes	213	4.4
HrB	Herndon silt loam, 2 to 6 percent slopes	146	3.0
HrC	Herndon silt loam, 6 to 10 percent slopes	76	1.6
IrB	Iredell loam, 2 to 6 percent slopes	23	0.5
LmB	Lignum silt loam, 2 to 6 percent slopes	791	16.2
NaB	Nason gravelly loam, 2 to 6 percent slopes	182	3.7
NaC	Nason gravelly loam, 6 to 10 percent slopes	83	1.7
NaE	Nason gravelly loam, 10 to 25 percent slopes	156	3.2
NaF	Nason gravelly loam, 25 to 50 percent slopes	88	1.8
PaE	Pacolet sandy loam, 10 to 25 percent slopes	108	2.2
PaF	Pacolet sandy loam, 25 to 50 percent slopes	27	0.6
TaE	Tatum loam, 10 to 25 percent slopes	231	4.7
Ud	Udorthents, loamy	209	4.3
VaB	Vance sandy loam, 2 to 6 percent slopes	191	3.9
VaC	Vance sandy loam, 6 to 10 percent slopes	32	0.7
WaE	Wateree-Rion-Wedowee complex, 15 to 30 percent slopes	37	0.8
WeC	Wedowee sandy loam, 6 to 10 percent slopes	23	0.5
WeD**	Wedowee sandy loam, 10 to 15 percent slopes	0	*
WxE	Wilkes sandy loam, 10 to 25 percent slopes	15	0.3
W	Water	62	1.3
	Total	4,894	100.0

* Less than 0.1 percent.

** This map unit only occurs in the buffer zone.

Table 2.—Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed)

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume*	
ApB:										
Appling	8A	Slight	Slight	Slight	Slight	Moderate	Loblolly pine	84	118	Loblolly pine.
							Shortleaf pine	63	95	
							Virginia pine	77	118	
							Hickory	---	---	
							Scarlet oak	74	56	
							Southern red oak	---	---	
							Sweetgum	---	---	
							White oak	64	47	
							Yellow-poplar	81	73	
ApC:										
Appling	8A	Slight	Slight	Slight	Slight	Moderate	Loblolly pine	84	118	Loblolly pine.
							Shortleaf pine	63	95	
							Virginia pine	77	118	
							Hickory	---	---	
							Scarlet oak	74	56	
							Southern red oak	---	---	
							Sweetgum	---	---	
							White oak	64	47	
							Yellow-poplar	81	73	
CaB:										
Cecil	8A	Slight	Slight	Slight	Slight	Moderate	Loblolly pine	83	116	Loblolly pine.
							Shortleaf pine	67	103	
							Virginia pine	71	110	
							White oak	78	60	
							Northern red oak	81	63	
							Southern red oak	79	61	
							Post oak	72	54	
							Scarlet oak	81	63	
							Sweetgum	76	70	
							Yellow-poplar	92	93	
ChA:										
Chewacla	7W	Slight	Moderate	Slight	Moderate	Severe	Yellow-poplar	96	100	Yellow-poplar,
							Loblolly pine	95	142	loblolly pine,
							Sweetgum	100	138	sweetgum,
							Water oak	90	86	American
							Red maple	---	---	sycamore.
							Southern red oak	---	---	
							Willow oak	---	---	
Wehadkee	8W	Slight	Severe	Moderate	Moderate	Severe	Yellow-poplar	100	107	Yellow-poplar,
							Sweetgum	97	128	green ash,
							Loblolly pine	97	138	sweetgum,
							Willow oak	94	91	loblolly pine.
							Water oak	94	91	
							Amercian sycamore	---	---	
							River birch	---	---	

See footnote at end of table.

Table 2.—Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume*	Trees to plant
GeB:										
Georgeville	8A	Slight	Slight	Slight	Slight	Slight	Loblolly pine	81	112	Loblolly pine.
							Longleaf pine	67	72	
							Scarlet oak	70	52	
							Shortleaf pine	66	101	
							Southern red oak	72	54	
							White oak	72	54	
GeC:										
Georgeville	8A	Slight	Slight	Slight	Slight	Slight	Loblolly pine	81	112	Loblolly pine.
							Longleaf pine	67	72	
							Scarlet oak	70	52	
							Shortleaf pine	66	101	
							Southern red oak	72	54	
							White oak	72	54	
HeB:										
Helena	8A	Slight	Slight	Slight	Slight	Severe	Loblolly pine	84	118	Loblolly pine.
							Shortleaf pine	66	101	
							Virginia pine	---	---	
							Black oak	---	---	
							Hickory	---	---	
							Northern red oak	---	---	
							Southern red oak	---	---	
							Sweetgum	---	---	
							White oak	---	---	
							Yellow-poplar	---	---	
HeC:										
Helena	8A	Slight	Slight	Slight	Slight	Severe	Loblolly pine	84	118	Loblolly pine.
							Shortleaf pine	66	101	
							Virginia pine	---	---	
							Black oak	---	---	
							Hickory	---	---	
							Northern red oak	---	---	
							Southern red oak	---	---	
							Sweetgum	---	---	
							White oak	---	---	
							Yellow-poplar	---	---	
HrB:										
Herndon	8A	Slight	Slight	Slight	Slight	Slight	Loblolly pine	81	112	Loblolly pine.
							Shortleaf pine	66	101	
							Southern red oak	68	50	
							White oak	68	50	
							Yellow-poplar	91	92	
HrC:										
Herndon	8A	Slight	Slight	Slight	Slight	Slight	Loblolly pine	81	112	Loblolly pine.
							Shortleaf pine	66	101	
							Southern red oak	68	50	
							White oak	68	50	
							Yellow-poplar	91	92	
IrB:										
Iredell	6C	Slight	Moderate	Moderate	Slight	Moderate	Loblolly pine	72	96	Loblolly pine.
							Post oak	---	---	
							Shortleaf pine	52	72	
							White oak	---	---	

See footnote at end of table.

Table 2.—Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume*	
LmB:										
Lignum	9W	Slight	Slight	Moderate	Slight	Severe	Loblolly pine	89	129	Loblolly pine.
							Shortleaf pine	67	103	
							Southern red oak	74	56	
							Virginia pine	74	114	
							Northern red oak	---	---	
							Red maple	---	---	
							Yellow-poplar	---	---	
NaB:										
Nason	8A	Slight	Slight	Slight	Slight	Moderate	Loblolly pine	81	112	Loblolly pine.
							Northern red oak	76	58	
							Virginia pine	69	107	
							Shortleaf pine	60	88	
NaC:										
Nason	8A	Slight	Slight	Slight	Slight	Moderate	Loblolly pine	81	112	Loblolly pine.
							Northern red oak	76	58	
							Virginia pine	69	107	
							Shortleaf pine	60	88	
NaE:										
Nason	7R	Moderate	Moderate	Moderate	Slight	Slight	Loblolly pine	75	101	Loblolly pine.
							Virginia pine	59	88	
							Northern red oak	72	54	
							Shortleaf pine	56	80	
NaF:										
Nason	7R	Severe	Severe	Moderate	Slight	Slight	Loblolly pine	75	101	Loblolly pine.
							Virginia pine	59	88	
							Northern red oak	72	54	
							Shortleaf pine	56	80	
PaE:										
Pacolet	8R	Moderate	Moderate	Slight	Slight	Slight	Loblolly pine	85	120	Loblolly pine.
							Shortleaf pine	68	106	
							Yellow-poplar	90	90	
							Virginia pine	71	110	
							Hickory	---	---	
							Northern red oak	---	---	
							White oak	---	---	
PaF:										
Pacolet	8R	Severe	Severe	Slight	Slight	Slight	Loblolly pine	85	120	Loblolly pine.
							Shortleaf pine	68	106	
							Yellow-poplar	90	90	
							Virginia pine	71	110	
							Hickory	---	---	
							Northern red oak	---	---	
							White oak	---	---	
TaE:										
Tatum	7R	Moderate	Moderate	Moderate	Slight	Moderate	Loblolly pine	75	101	Loblolly pine.
							Virginia pine	58	86	
							Chestnut oak	55	38	
							White oak	55	38	

See footnote at end of table.

Table 2.—Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Potential productivity: Common trees	Site index	Volume*	Trees to plant
VaB:										
Vance	7A	Slight	Moderate	Slight	Slight	Moderate	Loblolly pine	73	98	Loblolly pine.
							Shortleaf pine	53	74	
							White oak	58	41	
							Northern red oak	67	49	
							Virginia pine	---	---	
							Hickory	---	---	
							Southern red oak	---	---	
							Sweetgum	---	---	
							Yellow-poplar	---	---	
VaC:										
Vance	7A	Slight	Moderate	Slight	Slight	Moderate	Loblolly pine	73	98	Loblolly pine.
							Shortleaf pine	53	74	
							White oak	58	41	
							Northern red oak	67	49	
							Hickory	---	---	
							Virginia pine	---	---	
							Southern red oak	---	---	
							Sweetgum	---	---	
							Yellow-poplar	---	---	
WaE:										
Wateree	7R	Moderate	Moderate	Moderate	Moderate	Slight	Loblolly pine	77	105	Loblolly pine.
							Virginia pine	71	110	
							Shortleaf pine	69	108	
							Southern red oak	72	54	
							White oak	68	50	
							Yellow-poplar	84	79	
Rion	8R	Moderate	Moderate	Slight	Slight	Slight	Loblolly pine	80	110	Loblolly pine.
							Hickory	---	---	
							Northern red oak	---	---	
							Post oak	65	48	
							Shortleaf pine	70	110	
							Southern red oak	80	62	
							Sweetgum	80	79	
							White oak	70	52	
							Yellow-poplar	90	90	
Wedowee	8R	Moderate	Moderate	Slight	Slight	Moderate	Loblolly pine	87	125	Loblolly pine.
							Virginia pine	68	105	
							Shortleaf pine	68	106	
							Southern red oak	74	56	
							Northern red oak	70	52	
							White oak	74	56	
WeC:										
Wedowee	8A	Slight	Slight	Slight	Slight	Moderate	Loblolly pine	87	125	Loblolly pine.
							Virginia pine	68	125	
							Shortleaf pine	68	106	
							Southern red oak	74	56	
							Northern red oak	70	52	
							White oak	74	56	

See footnote at end of table.

Table 2.—Woodland Management and Productivity--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Volume*	
WeD:										
Wedowee	8A	Slight	Slight	Slight	Slight	Moderate	Loblolly pine	87	125	Loblolly pine.
							Virginia pine	68	125	
							Shortleaf pine	68	106	
							Southern red oak	74	56	
							Northern red oak	70	52	
							White oak	74	56	
WxE:										
Wilkes	7R	Moderate	Moderate	Slight	Moderate	Moderate	Loblolly pine	70	93	Loblolly pine.
							Shortleaf pine	60	88	
							Virginia pine	---	---	
							Hickory	---	---	
							Post oak	79	61	
							Southern red oak	76	58	
							Sweetgum	82	84	
							White oak	---	---	

* Productivity class is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

Table 3.—Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Camp areas	Picnic areas	Paths and trails
ApB:			
Appling	Slight	Slight	Slight.
ApC:			
Appling	Moderate: slope.	Moderate: slope.	Slight.
CaB:			
Cecil	Slight	Slight	Slight.
ChA:			
Chewacla	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.
Wehadkee	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.
GeB:			
Georgeville	Slight	Slight	Severe: erodes easily.
GeC:			
Georgeville	Moderate: slope.	Moderate: slope.	Severe: erodes easily.
HeB:			
Helena	Severe: too acid.	Severe: too acid.	Moderate: wetness.
HeC:			
Helena	Severe: too acid.	Severe: too acid.	Moderate: wetness.
HrB:			
Herndon	Slight	Slight	Severe: erodes easily.
HrC:			
Herndon	Moderate: slope.	Moderate: slope.	Severe: erodes easily.
IrB:			
Iredell	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
LmB:			
Lignum	Severe: percs slowly, wetness.	Severe: percs slowly.	Moderate: wetness.

Table 3.—Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Paths and trails
NaB:			
Nason	Moderate: small stones.	Moderate: small stones.	Slight.
NaC:			
Nason	Moderate: slope, small stones.	Moderate: slope, small stones.	Slight.
NaE:			
Nason	Severe: slope.	Severe: slope.	Moderate: slope.
NaF:			
Nason	Severe: slope.	Severe: slope.	Severe: slope.
PaE:			
Pacolet	Severe: slope.	Severe: slope.	Moderate: slope.
PaF:			
Pacolet	Severe: slope.	Severe: slope.	Severe: slope.
TaE:			
Tatum	Severe: slope.	Severe: slope.	Severe: erodes easily.
VaB:			
Vance	Moderate: percs slowly.	Moderate: percs slowly.	Slight.
VaC:			
Vance	Moderate: slope.	Moderate: slope.	Slight.
WaE:			
Wateree	Severe: slope.	Severe: slope.	Moderate: slope.
Rion	Severe: slope.	Severe: slope.	Moderate: slope.
Wedowee	Severe: slope.	Severe: slope.	Moderate: slope.
WeC:			
Wedowee	Moderate: slope.	Moderate: slope.	Slight.
WeD:			
Wedowee	Moderate: slope.	Moderate: slope.	Slight.
WxE:			
Wilkes	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope.

Table 4.—Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
ApB:										
Appling	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
ApC:										
Appling	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
CaB:										
Cecil	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
ChA:										
Chewacla	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
Wehadkee	Very poor.	Poor	Poor	Fair	Fair	Good	Fair	Poor	Fair	Fair.
GeB:										
Georgeville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
GeC:										
Georgeville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HeB:										
Helena	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HeC:										
Helena	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HrB:										
Herndon	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
HrC:										
Herndon	Fair	Good	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
IrB:										
Iredell	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LmB:										
Lignum	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
NaB:										
Nason	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
NaC:										
Nason	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

Table 4.—Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
NaE:										
Nason	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
NaF:										
Nason	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
PaE:										
Pacolet	Very poor.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
PaF:										
Pacolet	Very poor.	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
TaE:										
Tatum	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
VaB:										
Vance	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
VaC:										
Vance	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WaE:										
Wateree	Poor	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Rion	Poor	Poor	Poor	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Wedowee	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
WeC:										
Wedowee	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WeD:										
Wedowee	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
WxE:										
Wilkes	Poor	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

Table 5.—Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
ApB:						
Appling	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
ApC:						
Appling	Moderate: slope, too clayey.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
CaB:						
Cecil	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
ChA:						
Chewacla	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, low strength, wetness.	Severe: flooding, wetness.
Wehadkee	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, low strength, wetness.	Severe: flooding, wetness.
GeB:						
Georgeville	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
GeC:						
Georgeville	Moderate: slope, too clayey.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
HeB:						
Helena	Severe: wetness.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell.	Severe: low strength, shrink-swell.	Moderate: wetness.
HeC:						
Helena	Severe: wetness.	Severe: shrink-swell.	Severe: shrink-swell, wetness.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.	Moderate: wetness, slope.
HrB:						
Herndon	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Moderate: low strength.	Slight.
HrC:						
Herndon	Moderate: slope, too clayey.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
IrB:						
Iredell	Severe: wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: shrink-swell, wetness.	Severe: low strength, shrink-swell.	Moderate: wetness.

Table 5.—Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
LmB:						
Lignum	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
NaB:						
Nason	Moderate: too clayey.	Slight	Slight	Moderate: slope.	Severe: low strength.	Moderate: large stones, small stones.
NaC:						
Nason	Moderate: slope, too clayey.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: large stones, slope, small stones.
NaE:						
Nason	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
NaF:						
Nason	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
PaE:						
Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
PaF:						
Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
TaE:						
Tatum	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
VaB:						
Vance	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
VaC:						
Vance	Moderate: slope, too clayey.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
WaE:						
Wateree	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rion	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

Table 5.—Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
WeC:						
Wedowee	Moderate: slope, too clayey.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
WeD:						
Wedowee	Moderate: slope, too clayey.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope.	Moderate: slope.
WxE:						
Wilkes	Severe: slope, depth to rock.	Severe: slope.	Severe: slope. depth to rock.	Severe: slope.	Severe: low strength, slope.	Severe: slope, depth to rock.

Table 6.—Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
ApB:					
Appling	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: hard to pack, too clayey.
ApC:					
Appling	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: hard to pack, slope, too clayey.
CaB:					
Cecil	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: hard to pack, too clayey.
ChA:					
Chewacla	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack, wetness.
Wehadkee	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: thin layer, wetness.
GeB:					
Georgeville	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: hard to pack, too clayey.
GeC:					
Georgeville	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: hard to pack, slope, too clayey.
HeB:					
Helena	Severe: percs slowly, wetness.	Moderate: slope.	Severe: too clayey, wetness.	Moderate: wetness.	Poor: hard to pack, too clayey.
HeC:					
Helena	Severe: percs slowly, wetness.	Severe: slope.	Severe: too clayey, wetness.	Moderate: slope, wetness.	Poor: hard to pack, too clayey.
HrB:					
Herndon	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: hard to pack, too clayey.
HrC:					
Herndon	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: hard to pack, slope, too clayey.

Table 6.—Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
IrB: Iredell	Severe: percs slowly, wetness.	Moderate: slope, depth to rock.	Severe: too clayey, wetness, depth to rock.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.
LmB: Lignum	Severe: percs slowly, wetness.	Moderate: slope, depth to rock.	Severe: too clayey, wetness, depth to rock.	Severe: wetness.	Poor: hard to pack, too clayey, wetness.
NaB: Nason	Moderate: percs slowly, depth to rock.	Moderate: seepage, slope, depth to rock.	Severe: too clayey, depth to rock.	Moderate: depth to rock.	Poor: hard to pack, too clayey.
NaC: Nason	Moderate: percs slowly, slope, depth to rock.	Severe: slope.	Severe: too clayey, depth to rock.	Moderate: slope, depth to rock.	Poor: hard to pack, too clayey.
NaE: Nason	Severe: slope.	Severe: slope.	Severe: slope, too clayey, depth to rock.	Severe: slope.	Poor: hard to pack, slope, too clayey.
NaF: Nason	Severe: slope.	Severe: slope.	Severe: slope, too clayey, depth to rock.	Severe: slope.	Poor: hard to pack, slope, too clayey.
PaE: Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
PaF: Pacolet	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
TaE: Tatum	Severe: slope.	Severe: slope.	Severe: slope, too clayey, depth to rock.	Severe: slope.	Poor: hard to pack, slope, too clayey.
VaB: Vance	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: hard to pack, too clayey.
VaC: Vance	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: hard to pack, too clayey.

Table 6.—Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
WaE:					
Wateree	Severe: slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Severe: seepage, slope, depth to rock.	Poor: slope, depth to rock.
Rion	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.
Wedowee	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
WeC:					
Wedowee	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope, small stones.
WeD:					
Wedowee	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope, small stones.
WxE:					
Wilkes	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, too clayey, depth to rock.	Severe: slope, depth to rock.	Poor: hard to pack, too clayey, depth to rock.

Table 7.—Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
ApB:				
Appling	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
ApC:				
Appling	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
CaB:				
Cecil	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
ChA:				
Chewacla	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Wehadkee	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
GeB:				
Georgeville	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
GeC:				
Georgeville	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
HeB:				
Helena	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, too acid.
HeC:				
Helena	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, too acid.
HrB:				
Herndon	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
HrC:				
Herndon	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
IrB:				
Iredell	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, too clayey.
LmB:				
Lignum	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, too clayey.

Table 7.—Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
NaB:				
Nason	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, too clayey.
NaC:				
Nason	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, too clayey.
NaE:				
Nason	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, too clayey.
NaF:				
Nason	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, too clayey.
PaE:				
Pacolet	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey.
PaF:				
Pacolet	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey.
TaE:				
Tatum	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, too clayey.
VaB:				
Vance	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
VaC:				
Vance	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
WaE:				
Wateree	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Rion	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Wedowee	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope, too clayey.
WeC:				
Wedowee	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

Table 7.—Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
WeD:				
Wedowee	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
WxE:				
Wilkes	Poor: low strength, depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, too clayey, depth to rock.

Table 8.—Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
ApB:							
Appling	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope	Soil blowing	Favorable.
ApC:							
Appling	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Slope	Slope, soil blowing.	Slope.
CaB:							
Cecil	Moderate: seepage, slope.	Severe: hard to pack, piping.	Severe: no water.	Deep to water	Slope, soil blowing.	Soil blowing	Favorable.
ChA:							
Chewacla	Moderate: seepage.	Severe: hard to pack, piping, wetness.	Moderate: slow refill.	Flooding	Flooding, wetness.	Wetness	Wetness.
Wehadkee	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Flooding	Flooding, wetness, soil blowing.	Wetness, soil blowing.	Wetness.
GeB:							
Georgeville	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
GeC:							
Georgeville	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
HeB:							
Helena	Moderate: slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Percs slowly, wetness.	Percs slowly.
HeC:							
Helena	Severe: slope.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Percs slowly, slope, wetness.	Percs slowly, slope.

Table 8.—Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
HrB: Herndon	Moderate: seepage, slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily	Erodes easily.
HrC: Herndon	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.
IrB: Iredell	Moderate: slope, depth to rock.	Severe: hard to pack.	Severe: no water.	Percs slowly, slope.	Slope, wetness.	Wetness	Percs slowly, wetness.
LmB: Lignum	Moderate: slope, depth to rock.	Moderate: hard to pack, thin layer, wetness.	Severe: no water.	Percs slowly, slope.	Percs slowly, slope, wetness.	Erodes easily, wetness.	Erodes easily, wetness.
NaB: Nason	Moderate: seepage, slope, depth to rock.	Severe: thin layer.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
NaC: Nason	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope	Slope	Slope.
NaE: Nason	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope	Slope	Slope.
NaF: Nason	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope	Slope	Slope.
PaE: Pacolet	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope, soil blowing.	Slope.
PaF: Pacolet	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope, soil blowing.	Slope.
TaE: Tatum	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Erodes easily, slope.	Erodes easily, slope.	Erodes easily, slope.

Table 8.—Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
VaB:							
Vance	Moderate: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Percs slowly, slope, soil blowing.	Percs slowly	Percs slowly.
VaC:							
Vance	Severe: slope.	Severe: hard to pack.	Severe: no water.	Deep to water	Percs slowly, slope, soil blowing.	Percs slowly, slope.	Percs slowly, slope.
WaE:							
Wateree	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty.	Slope, soil blowing, depth to rock.	Slope, depth to rock, droughty.
Rion	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty.	Slope, soil blowing.	Slope, droughty.
Wedowee	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
WeC:							
Wedowee	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
WeD:							
Wedowee	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
WxE:							
Wilkes	Severe: slope, depth to rock.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.

Table 9.—Engineering Index Properties

(Absence of an entry indicates that the data were not estimated. The symbol > means greater than; < means less than)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
ApB:												
Appling	0-11	Sandy loam	SC-SM, SM	A-2	0	0-5	86-100	80-100	55-91	15-35	15-35	NP-7
	11-41	Sandy clay, clay loam, clay.	CL, ML, MH	A-7	0	0-5	95-100	90-100	70-95	51-80	41-74	15-30
	41-65	Sandy clay, clay loam, sandy clay loam.	CL, SC	A-6, A-4, A-7	0	0-5	95-100	85-100	70-90	40-75	30-50	8-22
ApC:												
Appling	0-9	Sandy loam	SC-SM, SM	A-2	0	0-5	86-100	80-100	55-91	15-35	15-35	NP-7
	9-44	Sandy clay, clay loam, sandy clay loam.	CL, SC	A-4, A-6, A-7	0	0-5	95-100	85-100	70-90	40-75	30-50	8-22
	44-72	Variable			---	---	---	---	---	---	---	---
CaB:												
Cecil	0-8	Sandy loam	SC-SM, SM	A-2, A-4	0	0-5	84-100	80-100	67-90	26-42	15-30	NP-7
	8-55	Clay, clay loam	CH, MH, ML	A-5, A-7	0	0-5	97-100	92-100	72-100	55-95	41-80	9-37
	55-65	Variable			---	---	---	---	---	---	---	---
ChA:												
Chewacla	0-6	Loam	CL-ML, CL, ML	A-6, A-4, A-7	0	0	98-100	95-100	70-100	55-90	25-49	4-20
	6-19	Sandy clay loam, loam, sandy loam.	ML, CL, SC-SM, SM	A-4, A-6, A-7-6	0	0	96-100	95-100	60-100	36-70	20-45	2-15
	19-65	Variable			---	---	---	---	---	---	---	---
Wehadkee	0-14	Loam	SC, SC-SM, SM	A-2, A-4	0	0	100	95-100	60-90	30-50	20-30	NP-10
	14-42	Silty clay loam, loam, sandy clay loam.	CL-ML, CL, ML, SC	A-4, A-6, A-7	0	0	100	99-100	85-100	45-98	25-58	6-25
	42-72	Variable			---	---	---	---	---	---	---	---
GeB:												
Georgeville	0-8	Silt loam	ML	A-4, A-6	0-1	0-2	90-100	80-100	65-100	55-95	0-40	NP-11
	8-62	Clay, silty clay, silty clay loam.	MH, ML	A-7	0	0-1	95-100	95-100	90-100	75-98	41-85	15-45
	62-72	Silty clay loam, loam, silt loam.	CL-ML, CL, ML	A-4, A-6	0	0-5	90-100	90-100	65-100	51-95	0-30	NP-12
GeC:												
Georgeville	0-5	Silt loam	ML	A-4, A-6	0-1	0-2	90-100	80-100	65-100	55-95	0-40	NP-11
	5-48	Clay, silty clay, silty clay loam.	MH, ML	A-7	0	0-1	95-100	95-100	90-100	75-98	41-85	15-45
	48-65	Silty clay loam, loam, silt loam.	CL, CL-ML, ML	A-4, A-6	0	0-5	90-100	90-100	65-100	51-95	0-30	NP-12

Table 9.—Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
HeB:												
Helena	0-12	Sandy loam	SC, ML, SC-SM, SM	A-2, A-4	0	0-5	90-100	90-100	51-95	26-75	15-35	NP-10
	12-19	Sandy clay loam, clay loam.	CL, SC	A-6, A-7	0	0-5	95-100	95-100	70-90	38-70	30-49	15-26
	19-50	Clay loam, sandy clay, clay.	CH	A-7	0	0-5	95-100	95-100	73-97	56-86	50-85	24-50
	50-72	Variable			---	---	---	---	---	---	---	---
HeC:												
Helena	0-11	Sandy loam	ML, SC, SM, SC-SM	A-2, A-4	0	0-5	90-100	90-100	51-95	26-75	15-35	NP-10
	11-26	Sandy clay loam, clay loam.	CL, SC	A-6, A-7	0	0-5	95-100	95-100	70-90	38-70	30-49	15-26
	26-44	Clay loam, sandy clay, clay.	CH	A-7	0	0-5	95-100	95-100	73-97	56-86	50-85	24-50
	44-65	Variable			---	---	---	---	---	---	---	---
HrB:												
Herndon	0-8	Silt loam	CL-ML, CL, ML	A-4, A-6	0-1	0-2	90-100	85-100	80-98	60-90	0-36	NP-12
	8-40	Silty clay loam, silty clay, clay.	MH, CL, ML	A-7	0	0-1	98-100	90-100	80-99	70-98	41-70	13-40
	40-65	Silt loam, loam, fine sandy loam.	MH, ML	A-5, A-7	0	0-2	90-100	85-100	80-99	51-95	41-70	9-36
HrC:												
Herndon	0-10	Silt loam	CL, ML, CL-ML	A-4, A-6	0-1	0-2	90-100	85-100	80-98	60-90	0-36	NP-12
	10-55	Silty clay loam, silty clay, clay.	CL, MH, ML	A-7	0	0-1	98-100	90-100	80-99	70-98	41-70	13-40
	55-65	Silt loam, loam, fine sandy loam.	MH, ML	A-5, A-7	0	0-2	90-100	85-100	80-99	51-95	41-70	9-36
IrB:												
Iredell	0-10	Loam	CL-ML, CL, ML	A-4, A-6	0-1	0-1	99-100	95-100	80-95	51-70	25-38	5-12
	10-28	Clay, clay loam	CH	A-7	0	0	99-100	60-100	60-100	55-95	54-115	29-85
	28-53	Loam, sandy clay loam, sandy loam.	CL, CL-ML	A-4, A-6	0-1	0-1	98-100	85-100	70-95	40-75	30-50	10-30
	53-65	Weathered bedrock.			---	---	---	---	---	---	---	---
LmB:												
Lignum	0-14	Silt loam	CL, CL-ML	A-4, A-6	0	0	95-100	80-100	80-100	55-90	20-35	5-19
	14-34	Silty clay loam, silty clay, clay.	CH, CL	A-7	0	0-5	80-100	75-100	70-100	55-90	45-70	22-45
	34-46	Silty clay loam, gravelly silty clay loam, silt loam.	CL, ML, SM, SC	A-4, A-6, A-2, A-7	0	0-15	70-85	35-80	30-80	20-75	30-50	8-18
	46-62	Weathered bedrock.			---	---	---	---	---	---	---	---

Table 9.—Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
NaB:												
Nason	0-12	Gravelly loam	GM, ML, SM	A-2, A-1, A-4	---	0-10	65-85	55-75	40-75	20-70	0-38	NP-10
	12-32	Silty clay loam, silty clay, clay.	CH, CL	A-7	---	0-5	80-100	75-100	70-95	65-90	40-60	15-30
	32-42	Channery silt loam, silt loam, silty clay loam.	CL-ML, CL, GC, SC	A-2, A-6, A-4	---	0-5	60-80	50-75	40-75	30-70	20-35	4-12
	42-60	Weathered bedrock.			---	---	---	---	---	---	---	---
NaC:												
Nason	0-11	Gravelly loam	GM, SM, ML	A-1, A-2, A-4	---	0-10	65-85	55-75	40-75	20-70	0-38	NP-10
	11-31	Silty clay loam, silty clay, clay.	CH, CL	A-7	---	0-5	80-100	75-100	70-95	65-90	40-60	15-30
	31-52	Channery silt loam, silt loam, silty clay loam.	CL, SC, CL-ML, GC	A-2, A-4, A-6	---	0-5	60-80	50-75	40-75	30-70	20-35	4-12
	52-62	Weathered bedrock.			---	---	---	---	---	---	---	---
NaE:												
Nason	0-11	Gravelly loam	ML, GM, SM	A-1, A-4, A-2	---	0-10	65-85	55-75	40-75	20-70	0-38	NP-10
	11-40	Silty clay loam, silty clay, clay.	CH, CL	A-7	---	0-5	80-100	75-100	70-95	65-90	40-60	15-30
	40-62	Weathered bedrock.			---	---	---	---	---	---	---	---
NaF:												
Nason	0-5	Gravelly loam	GM, SM, ML	A-1, A-2, A-4	---	0-10	65-85	55-75	40-75	20-70	0-38	NP-10
	5-32	Silty clay loam, silty clay, clay.	CH, CL	A-7	---	0-5	80-100	75-100	70-95	65-90	40-60	15-30
	32-40	Channery silt loam, silt loam, silty clay loam.	CL, CL-ML, SC, GC	A-2, A-4, A-6	---	0-5	60-80	50-75	40-75	30-70	20-35	4-12
	40-62	Weathered bedrock.			---	---	---	---	---	---	---	---
PaE:												
Pacolet	0-8	Sandy loam	SC-SM, SM	A-1-b, A-2, A-4	0-1	0-2	85-100	80-100	42-90	16-42	0-28	NP-7
	8-25	Sandy clay, clay loam, clay.	MH, CL, ML	A-6, A-7	0-1	0-1	80-100	80-100	60-100	51-75	38-65	11-33
	25-40	Clay loam, sandy clay loam, sandy loam.	CL-ML, CL, SC, SC-SM	A-2, A-4, A-6	0-1	0-2	80-100	70-100	60-80	30-60	20-35	5-15
	40-65	Sandy loam, fine sandy loam, loam.	SC-SM, SM	A-2-4, A-4	0-1	0-2	80-100	70-100	60-90	25-50	0-28	NP-6

Table 9.—Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
PaF:												
Pacolet	0-10	Sandy loam	SC-SM, SM	A-1-b, A-2, A-4	0-1	0-2	85-100	80-100	42-90	16-42	0-28	NP-7
	10-26	Sandy clay, clay loam, clay.	CL, ML, MH	A-6, A-7	0-1	0-1	80-100	80-100	60-100	51-75	38-65	11-33
	26-34	Clay loam, sandy clay loam, sandy loam.	CL, SC-SM, CL-ML, SC	A-4, A-2, A-6	0-1	0-2	80-100	70-100	60-80	30-60	20-35	5-15
	34-65	Sandy loam, fine sandy loam, loam.	SC-SM, SM	A-2-4, A-4	0-1	0-2	80-100	70-100	60-90	25-50	0-28	NP-6
TaE:												
Tatum	0-5	Loam	CL, ML, CL-ML	A-4, A-6	---	0-5	85-100	80-100	65-100	60-90	20-34	5-15
	5-58	Silty clay loam, silty clay, clay.	CH, MH	A-7	---	0-5	75-100	75-95	60-95	55-95	50-80	20-45
	58-70	Weathered bedrock.			---	---	---	---	---	---	---	---
VaB:												
Vance	0-9	Sandy loam	SC-SM, SM	A-2, A-4	0	0-5	90-100	80-100	55-80	15-40	15-27	NP-7
	9-60	Clay loam, sandy clay, clay.	CH	A-7	0	0-5	95-100	90-100	75-95	65-80	51-80	25-48
	60-80	Variable			---	---	---	---	---	---	---	---
VaC:												
Vance	0-4	Sandy loam	SC-SM, SM	A-2, A-4	0	0-5	90-100	80-100	55-80	15-40	15-27	NP-7
	4-48	Clay loam, sandy clay, clay.	CH	A-7	0	0-5	95-100	90-100	75-95	65-80	51-80	25-48
	48-62	Variable			---	---	---	---	---	---	---	---
WaE:												
Wateree	0-4	Sandy loam	SM	A-2, A-4	0-1	0-5	85-100	75-98	50-80	25-40	0-30	NP-7
	4-21	Coarse sandy loam, sandy loam.	SM	A-2	0	0-5	80-100	75-95	45-80	25-35	0-30	NP-7
	21-37	Sand, loamy sand, sandy loam.	SM, SP-SM	A-1, A-2, A-3	0	0-5	70-100	65-98	40-80	5-35	0-25	NP-3
	37-62	Weathered bedrock.			---	---	---	---	---	---	---	---
Rion	0-20	Sandy loam	SM	A-2, A-4	0-1	0-2	90-100	85-100	60-80	20-45	0-35	NP-7
	20-55	Sandy loam, sandy clay loam, clay loam.	CL-ML, SC, CL, SC-SM	A-2, A-4, A-6	0-1	0-2	90-100	85-100	60-85	30-60	20-35	5-15
	55-72	Sandy loam, sandy clay loam, loamy sand.	SC-SM, SC, SM	A-2, A-4, A-6	0-1	0-2	90-100	80-100	60-85	15-50	0-36	NP-12

Table 9.—Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
WaE:												
Wedowee	0-12	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	95-100	80-100	50-99	23-50	0-30	NP-6
	12-35	Sandy clay, clay loam, clay.	CL, SC, MH, ML	A-6, A-7	0	0	95-100	95-100	65-97	45-75	28-58	5-30
	35-65	Sandy clay loam, clay loam, sandy loam.	CL-ML, CL, SC, SC-SM	A-2, A-4, A-6	0	0	80-100	70-100	60-80	30-60	20-54	5-25
WeC:												
Wedowee	0-12	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	95-100	80-100	50-99	23-50	0-30	NP-6
	12-20	Sandy clay, clay loam, clay.	MH, CL, ML, SC	A-6, A-7	0	0	95-100	95-100	65-97	45-75	28-58	5-30
	20-65	Sandy clay loam, clay loam, sandy loam.	CL, CL-ML, SC-SM, SC	A-2, A-4, A-6	0	0	80-100	70-100	60-80	30-60	20-54	5-25
WeD:												
Wedowee	0-9	Sandy loam	SC-SM, SM	A-2-4, A-4	0	0	95-100	80-100	50-99	23-50	0-30	NP-6
	9-12	Loam, sandy clay loam.	CL, ML, SM, SC	A-4, A-6	0	0	90-100	90-100	80-97	40-75	0-32	NP-15
	12-36	Sandy clay, clay loam, clay.	MH, CL, ML, SC	A-6, A-7	0	0	95-100	95-100	65-97	45-75	28-58	5-30
	36-60	Sandy clay loam, clay loam, sandy loam, silt loam.	CL, SC-SM, CL-ML, SC	A-2, A-4, A-6	0	0	80-100	70-100	60-80	30-60	20-54	5-25
WxE:												
Wilkes	0-6	Sandy loam	ML, SM	A-2, A-4	0-2	0-10	90-100	80-100	60-92	25-55	15-35	NP-7
	6-13	Clay loam, clay, sandy clay loam.	CH, CL	A-6, A-7	0-1	0-10	80-100	80-100	75-96	50-85	30-60	11-35
	13-48	Weathered bedrock.			---	---	---	---	---	---	---	---
	48	Unweathered bedrock.			---	---	---	---	---	---	---	---

Table 10.—Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
ApB:												
Appling	0-11	5-20	1.40-1.65	2.0-6.0	0.10-0.15	0.0-2.9	0.5-2.0	.24	.24	4	3	86
	11-41	35-60	1.25-1.45	0.6-2.0	0.15-0.17	0.0-2.9	0.0-0.5	.28	.28			
	41-65	20-45	1.25-1.45	0.6-2.0	0.12-0.16	0.0-2.9	0.0-0.5	.28	.28			
ApC:												
Appling	0-9	5-20	1.40-1.65	2.0-6.0	0.10-0.15	0.0-2.9	0.5-2.0	.24	.24	4	3	86
	9-44	35-50	1.25-1.45	0.6-2.0	0.12-0.16	0.0-2.9	0.0-0.5	.28	.28			
	44-72	---	---	---	---	---	---	---	---			
CaB:												
Cecil	0-8	5-20	1.30-1.50	2.0-6.0	0.12-0.14	0.0-2.9	0.5-1.0	.28	.28	4	3	86
	8-55	35-70	1.30-1.50	0.6-2.0	0.13-0.15	0.0-2.9	0.0-0.5	.28	.28			
	55-65	---	---	---	---	---	---	---	---			
ChA:												
Chewacla	0-6	10-35	1.30-1.60	0.6-2.0	0.15-0.24	0.0-2.9	1.0-4.0	.28	.28	5	5	56
	6-19	18-35	1.30-1.60	0.6-2.0	0.12-0.20	0.0-2.9	0.5-2.0	.28	.28			
	19-65	---	---	---	---	---	---	---	---			
Wehadkee	0-14	10-27	1.35-1.60	2.0-6.0	0.10-0.15	0.0-2.9	2.0-5.0	.24	.24	5	3	86
	14-42	18-35	1.30-1.50	0.6-2.0	0.16-0.20	0.0-2.9	0.0-2.0	.32	.32			
	42-72	---	---	---	---	---	---	---	---			
GeB:												
Georgeville	0-8	12-27	1.20-1.40	0.6-2.0	0.15-0.20	0.0-2.9	0.5-2.0	.43	.43	4	5	56
	8-62	35-65	1.20-1.40	0.6-2.0	0.13-0.18	0.0-2.9	0.0-0.5	.28	.28			
	62-72	15-27	1.20-1.40	0.6-2.0	0.05-0.10	0.0-2.9	0.0-0.5	.32	.32			
GeC:												
Georgeville	0-5	12-27	1.20-1.40	0.6-2.0	0.15-0.20	0.0-2.9	0.5-2.0	.43	.43	4	5	56
	5-48	35-65	1.20-1.40	0.6-2.0	0.13-0.18	0.0-2.9	0.0-0.5	.28	.28			
	48-65	15-27	1.20-1.40	0.6-2.0	0.05-0.10	0.0-2.9	0.0-0.5	.32	.32			
HeB:												
Helena	0-12	5-20	1.58-1.62	2.0-6.0	0.10-0.12	0.0-2.9	0.5-2.0	.24	.24	4	5	56
	12-19	20-35	1.46-1.56	0.2-0.6	0.13-0.15	3.0-5.9	0.0-0.5	.28	.28			
	19-50	35-60	1.44-1.55	0.06-0.2	0.13-0.15	6.0-8.9	0.0-0.5	.28	.28			
	50-72	---	---	---	---	---	---	---	---			
HeC:												
Helena	0-11	5-20	1.58-1.62	2.0-6.0	0.10-0.12	0.0-2.9	0.5-2.0	.24	.24	4	5	56
	11-26	20-35	1.46-1.56	0.2-0.6	0.13-0.15	3.0-5.9	0.0-0.5	.28	.28			
	26-44	35-60	1.44-1.55	0.06-0.2	0.13-0.15	6.0-8.9	0.0-0.5	.28	.28			
	44-65	---	---	---	---	---	---	---	---			
HrB:												
Herndon	0-8	12-27	1.20-1.40	0.6-2.0	0.14-0.20	0.0-2.9	0.5-1.0	.43	.43	5	5	56
	8-40	35-60	1.30-1.60	0.6-2.0	0.13-0.18	0.0-2.9	0.0-0.5	.28	.28			
	40-65	10-27	1.20-1.40	0.6-2.0	0.05-0.08	0.0-2.9	0.0-0.5	.32	.37			

Table 10.—Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
HrC:												
Herndon	0-10	5-27	1.20-1.40	0.6-2.0	0.14-0.20	0.0-2.9	0.5-1.0	.43	.43	5	5	56
	10-55	35-60	1.30-1.60	0.6-2.0	0.13-0.18	0.0-2.9	0.0-0.5	.28	.28			
	55-65	10-27	1.20-1.40	0.6-2.0	0.05-0.08	0.0-2.9	0.0-0.5	.32	.37			
IrB:												
Iredell	0-10	7-27	1.20-1.40	0.6-2.0	0.14-0.17	0.0-2.9	0.5-2.0	.32	.32	4	6	48
	10-28	40-60	1.20-1.45	0.06-0.2	0.16-0.22	9.0-25.0	0.0-0.5	.20	.20			
	28-53	10-35	1.30-1.60	0.06-0.2	0.14-0.18	3.0-5.9	0.0-0.5	.28	.28			
	53-65	---	---	---	---	---	---	---	---			
LmB:												
Lignum	0-14	12-27	1.20-1.50	0.6-2.0	0.14-0.20	0.0-2.9	0.5-2.0	.37	.37	4	3	86
	14-34	35-55	1.25-1.55	<0.06	0.10-0.18	3.0-5.9	0.0-0.5	.28	.28			
	34-46	20-40	1.25-1.55	0.2-0.6	0.10-0.18	0.0-2.9	0.0-0.5	.28	.32			
	46-62	---	---	<0.06	---	---	---	---	---			
NaB:												
Nason	0-12	7-27	1.35-1.45	0.6-2.0	0.14-0.20	0.0-2.9	2.0-5.0	.24	.43	4	3	86
	12-32	35-53	1.40-1.50	0.6-2.0	0.12-0.19	0.0-2.9	0.0-0.5	.32	.32			
	32-42	10-35	1.45-1.55	0.6-2.0	0.15-0.20	0.0-2.9	0.0-0.5	.24	.28			
	42-60	---	---	<0.06	---	---	---	---	---			
NaC:												
Nason	0-11	7-27	1.35-1.45	0.6-2.0	0.14-0.20	0.0-2.9	2.0-5.0	.24	.43	4	3	86
	11-31	35-53	1.40-1.50	0.6-2.0	0.12-0.19	0.0-2.9	0.0-0.5	.32	.32			
	31-52	10-35	1.45-1.55	0.6-2.0	0.15-0.20	0.0-2.9	0.0-0.5	.24	.28			
	52-62	---	---	<0.06	---	---	---	---	---			
NaE:												
Nason	0-11	7-27	1.35-1.45	0.6-2.0	0.14-0.20	0.0-2.9	2.0-5.0	.24	.43	4	3	86
	11-40	35-53	1.40-1.50	0.6-2.0	0.12-0.19	0.0-2.9	0.0-0.5	.32	.32			
	40-62	---	---	<0.06	---	---	---	---	---			
NaF:												
Nason	0-5	7-27	1.35-1.45	0.6-2.0	0.14-0.20	0.0-2.9	2.0-5.0	.24	.43	4	3	86
	5-32	35-53	1.40-1.50	0.6-2.0	0.12-0.19	0.0-2.9	0.0-0.5	.32	.32			
	32-40	10-35	1.45-1.55	0.6-2.0	0.15-0.20	0.0-2.9	0.0-0.5	.24	.28			
	40-62	---	---	<0.06	---	---	---	---	---			
PaE:												
Pacolet	0-8	8-20	1.00-1.50	2.0-6.0	0.08-0.12	0.0-2.9	0.5-2.0	.20	.20	3	3	86
	8-25	35-65	1.30-1.50	0.6-2.0	0.12-0.15	0.0-2.9	0.0-0.5	.28	.28			
	25-40	15-30	1.20-1.50	0.6-2.0	0.08-0.15	0.0-2.9	0.0-0.5	.28	.28			
	40-65	10-25	1.20-1.50	0.6-2.0	0.08-0.15	0.0-2.9	0.0-0.5	.28	.28			
PaF:												
Pacolet	0-10	8-20	1.00-1.50	2.0-6.0	0.08-0.12	0.0-2.9	0.5-2.0	.20	.20	3	3	86
	10-26	35-65	1.30-1.50	0.6-2.0	0.12-0.15	0.0-2.9	0.0-0.5	.28	.28			
	26-34	15-30	1.20-1.50	0.6-2.0	0.08-0.15	0.0-2.9	0.0-0.5	.28	.28			
	34-65	10-25	1.20-1.50	0.6-2.0	0.08-0.15	0.0-2.9	0.0-0.5	.28	.28			
TaE:												
Tatum	0-5	7-27	1.10-1.40	0.6-2.0	0.16-0.20	0.0-2.9	0.5-2.0	.37	.37	4	3	86
	5-58	35-50	1.40-1.60	0.6-2.0	0.10-0.19	0.0-2.9	0.0-0.5	.28	.28			
	58-70	---	---	<0.06	---	---	---	---	---			
VaB:												
Vance	0-9	5-20	1.45-1.70	2.0-6.0	0.10-0.14	0.0-2.9	0.5-2.0	.24	.24	3	3	86
	9-60	35-60	1.25-1.40	0.06-0.2	0.12-0.15	3.0-5.9	0.0-0.5	.28	.28			
	60-80	---	---	---	---	---	---	---	---			

Table 10.—Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
								Kw	Kf	T		
	In	Pct	g/cc	In/hr	In/in	Pct	Pct					
VaC:												
Vance	0-4	5-20	1.45-1.70	2.0-6.0	0.10-0.14	0.0-2.9	0.5-2.0	.24	.24	3	3	86
	4-48	35-60	1.25-1.40	0.06-0.2	0.12-0.15	3.0-5.9	0.0-0.5	.28	.28			
	48-62	---	---	---	---	---	---	---	---			
WaE:												
Wateree	0-4	5-20	1.40-1.60	2.0-6.0	0.08-0.12	0.0-2.9	0.5-1.0	.20	.24	3	3	86
	4-21	5-18	1.30-1.60	2.0-6.0	0.08-0.12	0.0-2.9	0.0-0.5	.20	.24			
	21-37	2-15	1.40-1.70	2.0-6.0	0.04-0.12	0.0-2.9	0.0-0.5	.17	.17			
	37-62	---	---	---	---	---	---	---	---			
Rion	0-20	5-20	1.30-1.50	2.0-6.0	0.08-0.12	0.0-2.9	0.5-2.0	.24	.24	3	3	86
	20-55	18-35	1.40-1.50	0.6-2.0	0.08-0.15	0.0-2.9	0.0-0.5	.20	.24			
	55-72	2-20	1.30-1.50	2.0-6.0	0.06-0.12	0.0-2.9	0.0-0.5	.20	.24			
Wedowee	0-12	5-20	1.25-1.60	2.0-6.0	0.10-0.18	0.0-2.9	0.5-3.0	.24	.24	4	3	86
	12-35	35-45	1.30-1.50	0.6-2.0	0.12-0.18	0.0-2.9	0.0-0.5	.28	.28			
	35-65	15-30	1.20-1.50	0.6-2.0	0.08-0.15	0.0-2.9	0.0-0.5	.28	.28			
WeC:												
Wedowee	0-12	5-20	1.25-1.60	2.0-6.0	0.10-0.18	0.0-2.9	0.5-3.0	.24	.24	4	3	86
	12-20	35-45	1.30-1.50	0.6-2.0	0.12-0.18	0.0-2.9	0.0-0.5	.28	.28			
	20-65	15-30	1.20-1.50	0.6-2.0	0.08-0.15	0.0-2.9	0.0-0.5	.28	.28			
WeD:												
Wedowee	0-9	5-20	1.25-1.60	2.0-6.0	0.10-0.18	0.0-2.9	0.5-3.0	.24	.24	4	3	86
	9-12	14-30	1.30-1.55	0.6-2.0	0.12-0.18	0.0-2.9	0.0-0.5	.28	.28			
	12-36	35-45	1.30-1.50	0.6-2.0	0.12-0.18	0.0-2.9	0.0-0.5	.28	.28			
	36-60	15-30	1.20-1.50	0.6-2.0	0.08-0.15	0.0-2.9	0.0-0.5	.28	.28			
WxE:												
Wilkes	0-6	5-20	1.30-1.50	2.0-6.0	0.11-0.15	0.0-2.9	0.5-2.0	.24	.24	2	5	56
	6-13	20-45	1.40-1.60	0.2-0.6	0.15-0.20	3.0-5.9	0.0-0.5	.32	.32			
	13-48	---	---	<0.06	---	---	---	---	---			
	48	---	---	<0.06	---	---	---	---	---			

Table 11.—Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated.
The symbol > means greater than; < means less than)

Map symbol and soil name	Depth	Effective cation-exchange capacity	Soil reaction
	In	meq/100 g	pH
ApB:			
Appling	0-11	1.0-5.0	4.5-6.5
	11-41	2.0-8.0	4.5-5.5
	41-65	2.0-8.0	4.5-5.5
ApC:			
Appling	0-9	1.0-5.0	4.5-6.5
	9-44	2.0-8.0	4.5-5.5
	44-72	2.0-8.0	---
CaB:			
Cecil	0-8	1.0-5.0	4.5-6.5
	8-55	2.0-8.0	4.5-5.5
	55-65	2.0-8.0	---
ChA:			
Chewacla	0-6	5.0-15	4.5-6.5
	6-19	10-20	4.5-6.5
	19-65	10-20	---
Wehadkee	0-14	5.0-20	4.5-6.5
	14-42	5.0-25	4.5-6.5
	42-72	5.0-25	---
GeB:			
Georgeville	0-8	1.0-5.0	4.5-7.3
	8-62	2.0-8.0	4.5-5.5
	62-72	2.0-8.0	4.5-5.5
GeC:			
Georgeville	0-5	1.0-5.0	4.5-7.3
	5-48	2.0-8.0	4.5-5.5
	48-65	2.0-8.0	4.5-5.5
HeB:			
Helena	0-12	1.0-5.0	3.5-6.5
	12-19	5.0-15	3.5-5.5
	19-50	10-20	3.5-5.5
	50-72	5.0-15	---
HeC:			
Helena	0-11	1.0-5.0	3.5-6.5
	11-26	5.0-15	3.5-5.5
	26-44	10-20	3.5-5.5
	44-65	5.0-15	---
HrB:			
Herndon	0-8	1.0-5.0	4.5-6.5
	8-40	2.0-8.0	3.6-5.5
	40-65	2.0-8.0	3.6-5.5
HrC:			
Herndon	0-10	1.0-5.0	4.5-6.5
	10-55	2.0-8.0	3.6-5.5
	55-65	2.0-8.0	3.6-5.5

Table 11.—Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Effective cation-exchange capacity	Soil reaction
	In	meq/100 g	pH
IrB:			
Iredell	0-10	1.0-5.0	5.1-7.3
	10-28	15-30	5.6-7.3
	28-53	10-20	6.1-7.8
	53-65	---	---
LmB:			
Lignum	0-14	1.0-5.0	4.5-5.5
	14-34	5.0-10	4.5-5.5
	34-46	5.0-10	4.5-5.5
	46-62	---	---
NaB:			
Nason	0-12	1.0-5.0	4.5-6.5
	12-32	2.0-8.0	4.5-5.5
	32-42	2.0-8.0	4.5-5.5
	42-60	---	---
NaC:			
Nason	0-11	1.0-5.0	4.5-6.5
	11-31	2.0-8.0	4.5-5.5
	31-52	2.0-8.0	4.5-5.5
	52-62	---	---
NaE:			
Nason	0-11	1.0-5.0	4.5-6.5
	11-40	2.0-8.0	4.5-5.5
	40-62	---	---
NaF:			
Nason	0-5	1.0-5.0	4.5-6.5
	5-32	2.0-8.0	4.5-5.5
	32-40	2.0-8.0	4.5-5.5
	40-62	---	---
PaE:			
Pacolet	0-8	1.0-5.0	4.5-6.5
	8-25	2.0-8.0	4.5-6.0
	25-40	2.0-8.0	4.5-6.0
	40-65	2.0-8.0	4.5-6.0
PaF:			
Pacolet	0-10	1.0-5.0	4.5-6.5
	10-26	2.0-8.0	4.5-6.0
	26-34	2.0-8.0	4.5-6.0
	34-65	2.0-8.0	4.5-6.0
TaE:			
Tatum	0-5	1.0-5.0	4.5-5.5
	5-58	2.0-8.0	4.5-5.5
	58-70	---	---
VaB:			
Vance	0-9	1.0-5.0	4.5-6.0
	9-60	10-20	4.5-5.5
	60-80	5.0-15	---
VaC:			
Vance	0-4	1.0-5.0	4.5-6.0
	4-48	10-20	4.5-5.5
	48-62	5.0-15	---

Table 11.—Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Effective cation-exchange capacity	Soil reaction
	In	meq/100 g	pH
WaE:			
Wateree	0-4	1.0-5.0	4.5-6.0
	4-21	2.0-8.0	4.5-6.0
	21-37	2.0-8.0	3.6-6.0
	37-62	---	---
Rion	0-20	1.0-5.0	4.5-6.5
	20-55	2.0-8.0	4.5-6.5
	55-72	2.0-8.0	4.5-6.5
Wedowee	0-12	1.0-5.0	3.6-5.5
	12-35	2.0-8.0	3.6-5.5
	35-65	2.0-8.0	3.6-5.5
WeC:			
Wedowee	0-12	1.0-5.0	3.6-5.5
	12-20	2.0-8.0	3.6-5.5
	20-65	2.0-8.0	3.6-5.5
WeD:			
Wedowee	0-9	1.0-5.0	3.6-5.5
	9-12	2.0-8.0	3.6-5.5
	12-36	2.0-8.0	3.6-5.5
	36-60	2.0-8.0	3.6-5.5
WxE:			
Wilkes	0-6	1.0-5.0	5.1-6.5
	6-13	5.0-15	6.1-7.8
	13-48	---	---
	48	---	---

Table 12.—Water Features

(Depths of layers are in feet. The symbol > means greater than; < means less than. See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydrologic group	Month	Water table		Flooding	
			Upper limit	Lower limit	Duration	Frequency
			Ft	Ft		
ApB:						
Appling	B					
		All months	>5.0	---	---	---
ApC:						
Appling	B					
		All months	>5.0	---	---	---
CaB:						
Cecil	B					
		All months	>5.0	---	---	---
ChA:						
Chewacla	C					
		January	0.5-2.0	>5.0	Brief	Frequent
		February	0.5-2.0	>5.0	Brief	Frequent
		March	0.5-2.0	>5.0	Brief	Frequent
		April	0.5-2.0	>5.0	Brief	Frequent
		May	0.5-2.0	>5.0	Very brief	Occasional
		June	1.5-2.0	>5.0	Very brief	Occasional
		July	3.0-4.0	>5.0	Very brief	Occasional
		August	3.3-4.5	>5.0	Very brief	Occasional
		September	3.3-4.5	>5.0	Very brief	Occasional
		October	1.5-2.0	>5.0	Very brief	Occasional
		November	0.5-2.0	>5.0	Brief	Frequent
		December	0.5-2.0	>5.0	Brief	Frequent
Wehadkee	D					
		January	0.0-1.0	>5.0	Long	Frequent
		February	0.0-1.0	>5.0	Long	Frequent
		March	0.0-1.0	>5.0	Long	Frequent
		April	0.5-1.0	>5.0	Long	Frequent
		May	0.5-1.0	>5.0	Long	Frequent
		June	1.0-2.0	>5.0	Long	Frequent
		July	1.0-2.0	>5.0	Brief	Occasional
		August	1.0-2.0	>5.0	Brief	Occasional
		September	1.0-2.0	>5.0	Brief	Occasional
		October	0.5-1.0	>5.0	Brief	Occasional
		November	0.0-1.0	>5.0	Long	Frequent
		December	0.0-1.0	>5.0	Long	Frequent
GeB:						
Georgeville	B					
		All months	>5.0	---	---	---
GeC:						
Georgeville	B					
		All months	>5.0	---	---	---

Table 12.—Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table		Flooding	
			Upper limit	Lower limit	Duration	Frequency
			Ft	Ft		
HeB:						
Helena	C					
		January	1.5-2.5	2.5-3.5	---	---
		February	1.5-2.5	2.5-3.5	---	---
		March	1.5-2.5	2.5-3.5	---	---
		April	1.5-2.5	2.5-3.5	---	---
		May	2.5-3.5	4.0-6.0	---	---
		June	4.0-6.0	>5.0	---	---
		July	4.0-6.0	>5.0	---	---
		August	4.0-6.0	>5.0	---	---
		September	4.0-6.0	>5.0	---	---
		October	2.5-3.5	2.5-3.5	---	---
		November	1.5-2.5	2.5-3.5	---	---
		December	1.5-2.5	2.5-3.5	---	---
HeC:						
Helena	C					
		January	1.5-2.5	2.5-3.5	---	---
		February	1.5-2.5	2.5-3.5	---	---
		March	1.5-2.5	2.5-3.5	---	---
		April	1.5-2.5	2.5-3.5	---	---
		May	2.5-3.5	4.0-6.0	---	---
		June	4.0-6.0	>5.0	---	---
		July	4.0-6.0	>5.0	---	---
		August	4.0-6.0	>5.0	---	---
		September	4.0-6.0	>5.0	---	---
		October	2.5-3.5	2.5-3.5	---	---
		November	1.5-2.5	2.5-3.5	---	---
		December	1.5-2.5	2.5-3.5	---	---
HrB:						
Herndon	B					
		All months	>5.0	---	---	---
HrC:						
Herndon	B					
		All months	>5.0	---	---	---
IrB:						
Iredell	C/D					
		January	1.0-2.0	2.0-3.0	---	---
		February	1.0-2.0	2.0-3.0	---	---
		March	1.0-2.0	2.0-3.0	---	---
		April	1.0-2.0	2.0-3.0	---	---
		May	2.0-3.0	3.0-4.0	---	---
		June	4.0-6.0	>5.0	---	---
		July	4.0-6.0	>5.0	---	---
		August	4.0-6.0	>5.0	---	---
		September	4.0-6.0	>5.0	---	---
		October	2.0-3.0	3.0-4.0	---	---
		November	1.5-2.5	2.5-3.5	---	---
		December	1.0-2.0	2.0-3.0	---	---

Table 12.—Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table		Flooding	
			Upper limit	Lower limit	Duration	Frequency
			Ft	Ft		
LmB:						
Lignum	C					
		January	1.0-2.5	2.0-3.5	---	---
		February	1.0-2.5	2.0-3.5	---	---
		March	1.0-2.5	2.0-3.5	---	---
		April	1.0-2.5	2.0-3.5	---	---
		May	1.0-2.5	2.0-3.5	---	---
		June	2.0-3.5	3.0-4.5	---	---
		July	4.0-6.0	>5.0	---	---
		August	4.0-6.0	>5.0	---	---
		September	4.0-6.0	>5.0	---	---
		October	2.0-3.5	3.0-4.5	---	---
		November	1.5-2.5	2.5-3.5	---	---
		December	1.0-2.5	2.0-3.5	---	---
NaB:						
Nason	B					
		All months	>5.0	---	---	---
NaC:						
Nason	B					
		All months	>5.0	---	---	---
NaE:						
Nason	B					
		All months	>5.0	---	---	---
NaF:						
Nason	B					
		All months	>5.0	---	---	---
PaE:						
Pacolet	B					
		All months	>5.0	---	---	---
PaF:						
Pacolet	B					
		All months	>5.0	---	---	---
TaE:						
Tatum	B					
		All months	>5.0	---	---	---
VaB:						
Vance	C					
		All months	>5.0	---	---	---
VaC:						
Vance	C					
		All months	>5.0	---	---	---
WaE:						
Wateree	B					
		All months	>5.0	---	---	---
Rion	B					
		All months	>5.0	---	---	---
Wedowee	B					
		All months	>5.0	---	---	---

Table 12.—Water Features--Continued

Map symbol and soil name	Hydrologic group	Month	Water table		Flooding	
			Upper limit	Lower limit	Duration	Frequency
			Ft	Ft		
WeC:						
Wedowee	B					
		All months	>5.0	---	---	---
WeD:						
Wedowee	B					
		All months	>5.0	---	---	---
WxE:						
Wilkes	C					
		All months	>5.0	---	---	---

Table 13.—Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Restrictive layer				Potential frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
		In	In				
ApB:							
Appling	---	---	---	---	Low	Moderate	Moderate
ApC:							
Appling	---	---	---	---	Low	Moderate	Moderate
CaB:							
Cecil	---	---	---	---	Low	High	High
ChA:							
Chewacla	---	---	---	---	Low	High	Moderate
Wehadkee	---	---	---	---	Low	High	Moderate
GeB:							
Georgeville	---	---	---	---	Low	High	High
GeC:							
Georgeville	---	---	---	---	Low	High	High
HeB:							
Helena	---	---	---	---	Low	High	High
HeC:							
Helena	---	---	---	---	Low	High	High
HrB:							
Herndon	---	---	---	---	Low	High	High
HrC:							
Herndon	---	---	---	---	Low	High	High
IrB:							
Iredell	Bedrock (paralithic)	40-60	12	Soft	Low	High	Low
LmB:							
Lignum	Bedrock (paralithic)	40-60	16+	Soft	Low	High	High
NaB:							
Nason	Bedrock (paralithic)	40-60	18+	Soft	Low	Moderate	High
NaC:							
Nason	Bedrock (paralithic)	40-60	10+	Soft	Low	Moderate	High
NaE:							
Nason	Bedrock (paralithic)	40-60	12+	Soft	Low	Moderate	High
NaF:							
Nason	Bedrock (paralithic)	40-60	22+	Soft	Low	Moderate	High

Table 13.—Soil Features--Continued

Map symbol and soil name	Restrictive layer				Potential frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated steel	Concrete
		In	In				
PaE:							
Pacolet	---	---	---	---	Low	High	High
PaF:							
Pacolet	---	---	---	---	Low	High	High
TaE:							
Tatum	Bedrock (paralithic)	40-60	12+	Soft	Low	High	High
VaB:							
Vance	---	---	---	---	Low	High	High
VaC:							
Vance	---	---	---	---	Low	High	High
WaE:							
Wateree	Bedrock (paralithic)	20-40	25+	Soft	Low	Low	High
Rion	---	---	---	---	Low	Moderate	High
Wedowee	---	---	---	---	Low	Moderate	High
WeC:							
Wedowee	---	---	---	---	Low	Moderate	High
WeD:							
Wedowee	---	---	---	---	Low	Moderate	High
WxE:							
Wilkes	Bedrock (paralithic)	10-20	35	Soft	Low	Moderate	Moderate
	Bedrock (lithic)	40-60		Hard			

Table 14.—Classification of the Soils

Soil name	Family or higher taxonomic class
Appling	Fine, kaolinitic, thermic Typic Kanhapludults
Cecil	Fine, kaolinitic, thermic Typic Kanhapludults
Chewacla	Fine-loamy, mixed, active, thermic Fluvaquentic Dystrudepts
Georgeville	Fine, kaolinitic, thermic Typic Hapludults
Helena	Fine, mixed, semiactive, thermic Aquic Hapludults
Herndon	Fine, kaolinitic, thermic Typic Hapludults
Iredell	Fine, smectitic, thermic Typic Hapludalfs
Lignum	Fine, mixed, semiactive, thermic Aquic Hapludults
Nason	Fine, kaolinitic, thermic Typic Hapludults
Pacolet	Fine, kaolinitic, thermic Typic Kanhapludults
Rion	Fine-loamy, mixed, semiactive, thermic Typic Hapludults
Tatum	Fine, kaolinitic, thermic Typic Hapludults
Udorthents	Udorthents
Vance	Fine, mixed, semiactive, thermic Typic Hapludults
Wateree	Coarse-loamy, mixed, semiactive, thermic Typic Dystrudepts
Wedowee	Fine, kaolinitic, thermic Typic Kanhapludults
Wehadkee	Fine-loamy, mixed, active, nonacid, thermic Fluvaquentic Endoaquepts
Wilkes	Loamy, mixed, active, thermic, shallow Typic Hapludalfs